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# STUDIES

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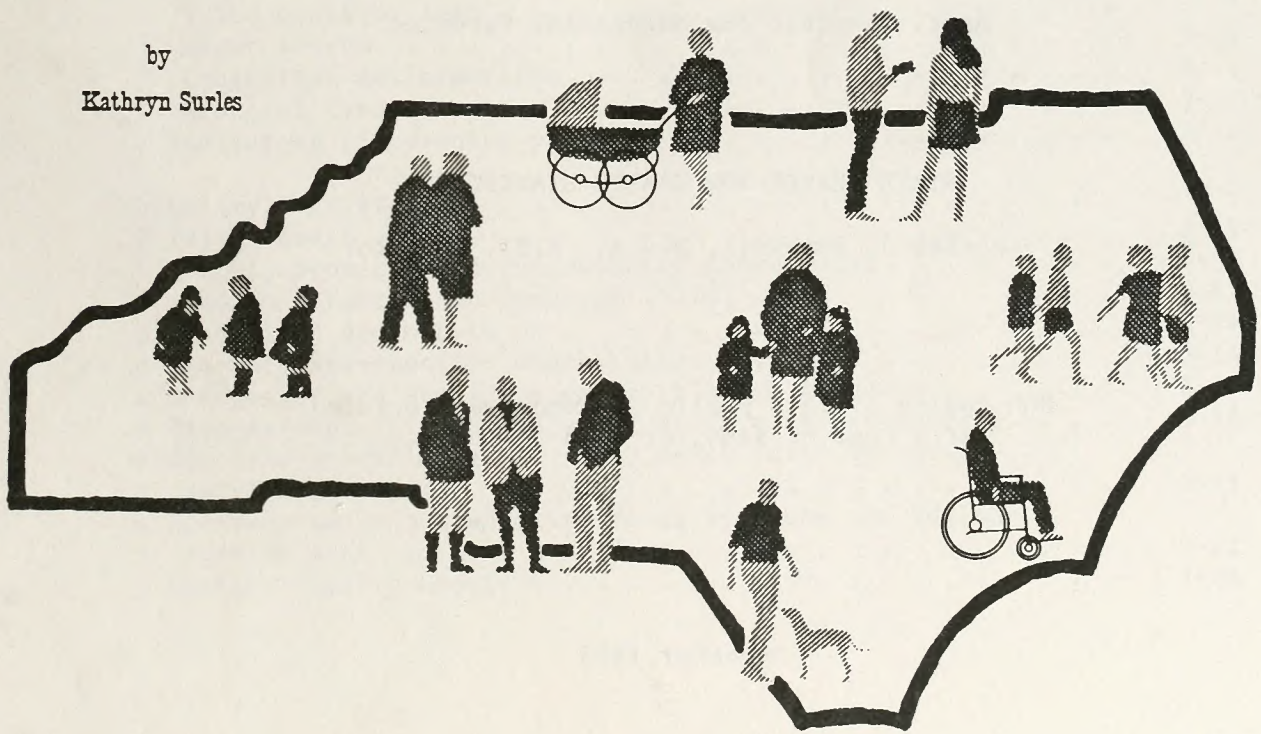
No. 28

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December, 1983

## North Carolina's Health

by  
Kathryn Surles



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1877-1983



## HIGHLIGHTS

This report depicts the health status and health habits of contemporary North Carolinians. In general, it spans a period of about twenty years, from a decade ago to a decade hence.

Compared to residents a decade ago, today's North Carolinians are living longer and have greater income and more education. More citizens are non-native and nonfarming. At the same time, the state has recently experienced renewed growth in its nonmetropolitan population, and nonwhites have migrated into the state rather than out as during the sixties. Compared to a decade ago, North Carolinians are also having fewer marriages, more divorces; fewer births, more legal abortions; fewer family households, more single parenting; fewer housewives, more working women and more children in day care; fewer deaths, more residents in nursing homes. Taken together, these changing characteristics of the populace are creating additional pressures on the state's health care resources.

And compared to our fellow Americans, today's North Carolinians are realizing:

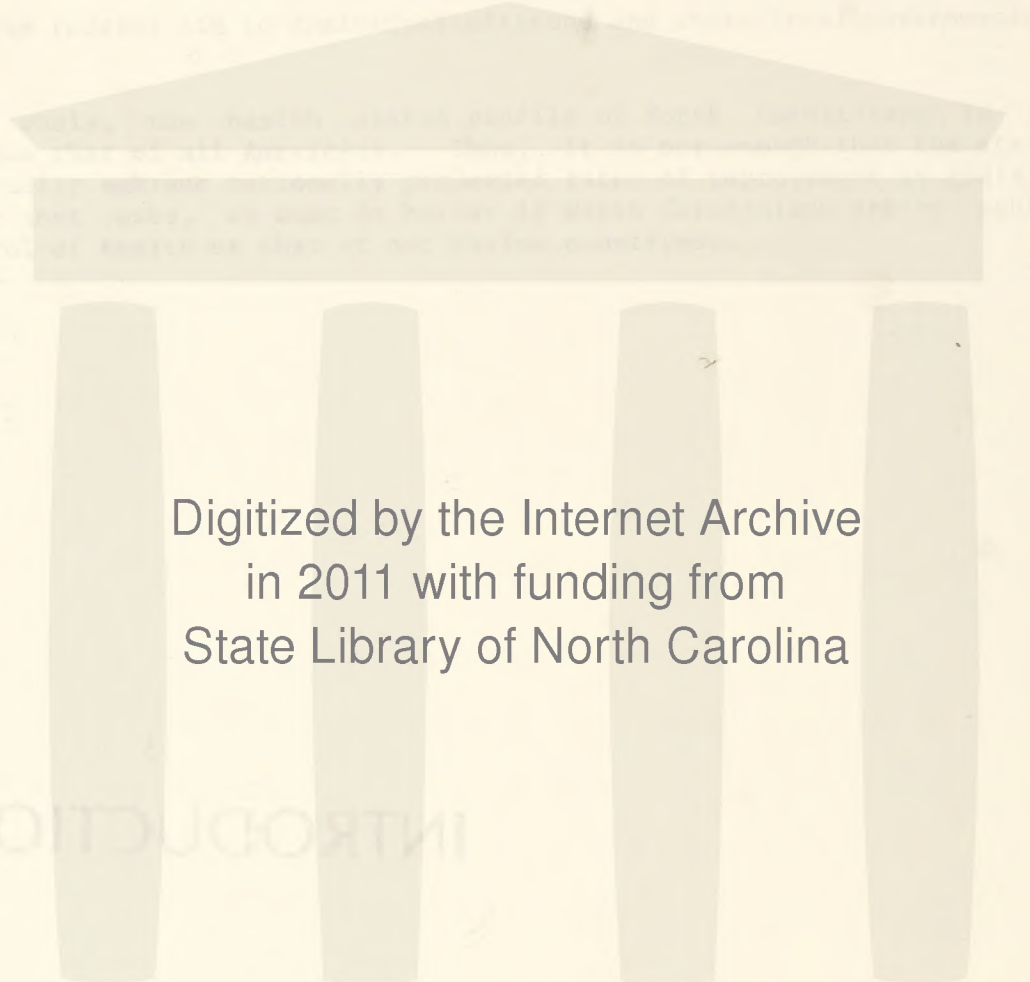
- Greater population growth and faster aging;
- Higher rates of poverty;
- Higher enrollment in schools but fewer high school graduates;
- Greater participation in the labor force, especially by women;
- High employment in manufacturing at minimum average wages;
- Greater reductions in births but higher rates at young ages;
- More mothers at risk of unsuccessful pregnancy and more infants lost;
- Better immunization of our children;
- More gonorrhea, TB, and certain other diseases;
- About the same declines in general mortality;
- Greater increases in overall cancer mortality with above-average risk for nonwhite males;

- More tendency to smoke but less alcohol consumed;
- Fewer health care resources and below-average utilization;
- Lower hospital costs but higher health insurance costs relative to benefits paid;
- Fewer fiscal resources for health care and hospitals; and
- Less federal aid to individual citizens and state/local governments.

On the whole, the health status profile of North Carolinians is less favorable than that of all Americans. Thus, it is not enough that the state's health community embrace nationally projected rates of improvement as goals of our own; in most cases, we must do better if North Carolinians are to achieve the same level of health as that of our fellow countrymen.



# INTRODUCTION



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## INTRODUCTION

The North Carolina population was enumerated at 5.08 million in April 1970, 5.88 million in April 1980 and was estimated at more than 6 million during 1982 (1,2). As observers of demographic trends will know, recent growth largely reflects a national trend whereby Americans, in fairly large numbers, have packed up their belongings and moved to the South. The state's population is expected to continue to grow, though at a somewhat slower rate, to a projected 6.8 - 7.7 million by the year 2000 (3).

North Carolina's population is also aging. The median age of 29.6 in 1980 compares to 26.5 in 1970 - an increase of 3.1 years during the decade (1,2). Factors involved in the aging trend are reductions in the birth rate, increases in average life expectancy and a disproportionate influx of older Americans. Some projections indicate that between 1976 and 1985 North Carolina's increase in the percentage of residents 65 and older will be double the nationwide increase (4). By the year 2000, it is expected that one of every eight North Carolinians will be sixty-five or older (3); that compares to one of every ten in 1980 (2).

At the same time, North Carolina has recently experienced a slow-down in metropolitan growth while the nonmetropolitan population expanded by nearly 15 percent between 1970 and 1980 compared to less than 3 percent between 1960 and 1970. This upturn in nonmetropolitan growth occurs in the face of a declining farm population. Recently also, nonwhites have been migrating into the state rather than out of the state as during the sixties. (5,6)

And, like the rest of the nation, North Carolina is undergoing unprecedented change in the number and composition of its households. Between 1970 and 1980, the number of nonfamily households - persons living alone or with nonrelatives - increased 110 percent while the number of one-parent households increased about 70 percent. In total, the number of N.C. households rose about 35 percent. (1,2)

On an optimistic note, the state's increase in inflation-adjusted personal income and corresponding decrease in the percentage of persons below poverty far exceeded national rates of improvement during the early seventies. Still, North Carolina remains well below average in those economic indicators as well as educational attainment. Moreover, a report recently released by the N.C. Division of Economic Opportunity reveals an increase in poverty, beginning in the mid-seventies and gaining momentum between 1980 and 1981. Those hardest hit

are households headed by women and the elderly. Among the elderly, the state's 1979 poverty rate of 24 percent compares with the nation's 15 percent. (2,3,7,8)

Altogether, the combination of the above factors portends an unprecedented demand for health services, particularly public health services. The elderly need health services more than young people; migrants to nonmetropolitan areas tend to be older (9) and to create additional pressures on rural services which may already be inadequate; and single householders, one-parent householders, and nonwhites often face economic disadvantage in the presence of their particular health needs. This mentions neither the additional demand for services created by increases in the sheer numbers of citizens nor that created by unemployment.

During the 1970s, the number of civilian health service personnel in North Carolina nearly doubled, rising from 82,363 to 159,676 (10,11). But optimism over the increase has been short-lived as the recent recession and resulting reductions-in-force have served to curtail if not reverse this trend. Even at 1980 staffing levels, North Carolina was among the worst states in terms of physician and dentist shortage-area designations and statewide ratios of residents to the numbers of dentists, nurses, hospital beds, etc. (4).

Again on an optimistic note, North Carolina has experienced below-average increases in hospital costs with a per diem well below national levels in 1980. But in this state as elsewhere, medical costs continue to rise disproportionately -- nationwide, by 4.5 times the increase in the Consumer Price Index during September 1982. In this state also, health insurance premium-to-benefit ratios are above nationwide levels, particularly among for-profit companies. Moreover, there are indications of increasing postponement of needed health services due to lapses in health insurance brought about by the employment situation. (12-14)

On these bases, it behooves North Carolina's health community to pause at this time, as early as census data availability would allow, to examine recent trends and current patterns in the health needs and health care of North Carolina's six million citizens. In particular, population and health statistics relevant to public health policy and administrative decisions of the 1980s need a long, hard look in order to achieve the most efficient and equitable use of public health's diminishing dollar.

In the section to follow, North Carolina's people, households, and workers are described in terms of health-related characteristics reported in U.S. censuses. Succeeding sections of this report examine health information from a variety of state and national reporting systems and surveys. In the health events section, measurable health goals for the U.S. in 1990 -- as formulated and published by the Surgeon General of the United States (15) -- are extrapolated to North Carolina. The intent here is not to say that North Carolina can or should embrace all of the goals; rather, the extrapolations are

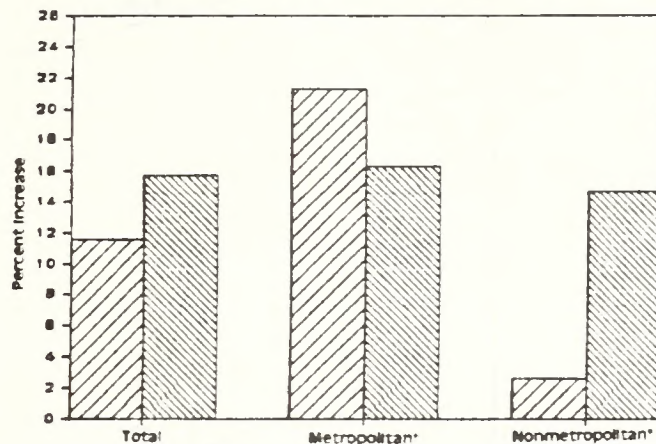


meant to provide benchmarks against which North Carolina's health community might assess: Can we achieve the projected statistic? Can we do better? In most cases, we must do better in order to improve the health of our citizens both absolutely and relative to the nation as a whole.

In Appendix I, the reader will find a compilation of the various U.S. health goals selected for inclusion in this report. For each goal, the following information is provided, item D being derived from items B and C.

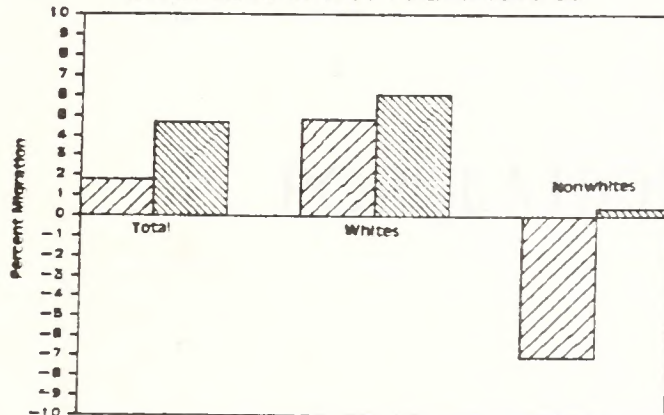
- A) N.C. annual change 1970 to 1980
- B) U.S. expected annual change 1980 to 1990
- C) N.C. 1980 statistic
- D) N.C. projected 1990 statistic
- E) U.S. 1990 goal
- F) Information concerning sources, definitions, etc.

**Population Increase—Area of Residence  
North Carolina 1960-70 and 1970-80**



\*Corrected for definitional changes between censuses

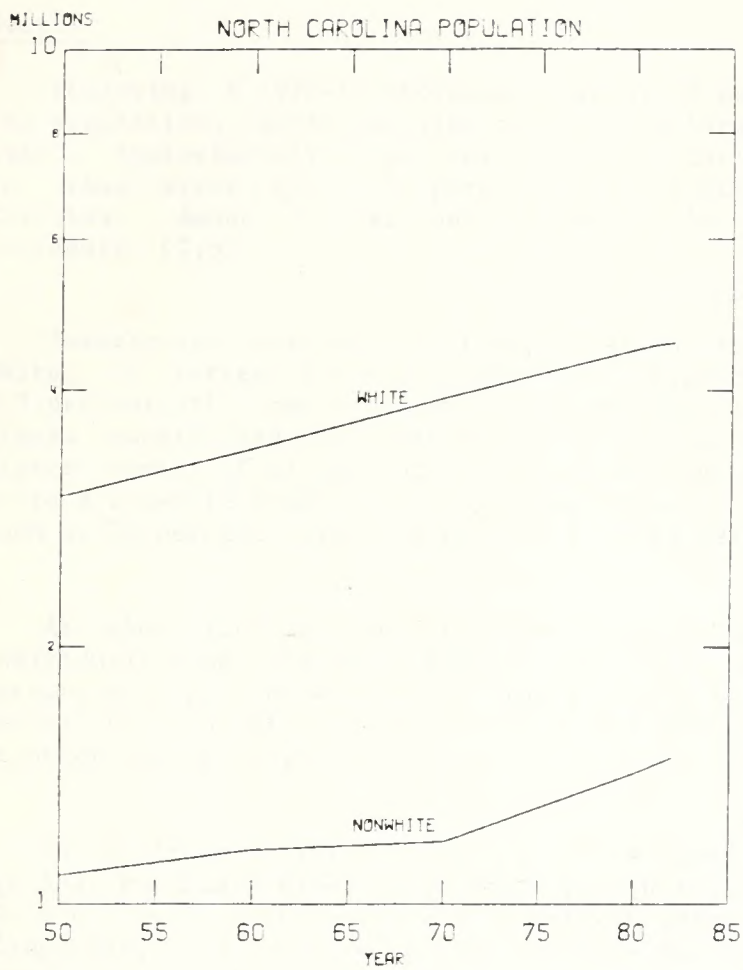
**Net Migration by Race  
North Carolina 1960-70 and 1970-80**



Key: 1960-1970 1970-1980







POPULATION AT RISK



## POPULATION AT RISK

### People

Following a 1970-80 increase of about 16 percent in census enumerations of the population, North Carolina ranked 10th largest of the 50 states on April 1, 1980. Approximately 48 percent of the population, or 2.8 million people, lived in urban areas while 52 percent, or 3.1 million, resided in rural North Carolina. Among states, only Pennsylvania had a larger number of rural residents. (2,5)

Seventy-six percent of the population (4.5 million) were classified as white, 22 percent black (1.3 million), 1 percent American Indian (64,536) and 0.7 percent other races (40,866). North Carolina was one of 5 states in which blacks constituted more than one-fifth of the population. Only 6 states had a higher number of blacks and only 4 states had more American Indians. And the state's nonwhite population is growing faster than the white, increasing by as much as 20 percent versus 14 percent between 1970 and 1980. (2,5)

At about 1.66 million, there were approximately 100,000 or 6 percent fewer individuals under age 18 in 1980 than in 1970; at 603,181, almost 200,000 or 46 percent more persons were 65 or older. Only 11 states had a greater number of Senior Citizens although North Carolina's median age of 29.6 was below that of 26 other states. (2,4)

In addition to large increases in its older population (beginning at about age 55), the state experienced rapid growth in its young labor force as ages 25-29 and 30-34 increased 45 and 55 percent respectively to a total of 963,748. Altogether, this increase appears entirely due to aging of the baby boom cohort, based on provisional estimates indicating the 25-29 age group actually experienced out-migration over and above the in-migration netted by persons 30-34. (16)

Among residents under age 18 in 1980, around 28 percent (616,416) were black; also, 28 percent (137,372) of those under age 6 were black. In contrast, blacks constituted only 19 percent (113,975) of the population 65 and older. Still, only four other states had a larger number of elderly blacks. (2,5)

Females still outnumbered males in 1980, 51.4 percent versus 48.6 percent. More than twice as many women (531,945) as men (207,292) aged 15 and over were separated, widowed or divorced; women constituted 85 percent (310,104) of widowed persons. (2)



Again due to aging of the baby boom population, the number of females of childbearing ages increased by more than one-quarter during the decade. However, as shown in the next table, most of the increase occurred beyond the high-fertility years, especially among whites. Moreover, females 10-14, who will age into the high-fertility years during the 1980s, actually experienced negative growth. (1,17)

#### Females At Or Approaching Childbearing Ages

<u>Age</u>	<u>Number in 1980</u>		<u>Percent Change Since 1970</u>	
	<u>Whites</u>	<u>Blacks</u>	<u>Whites</u>	<u>Blacks</u>
10-14	165,010	66,178	-8.3	-8.9
15-19	194,049	75,621	9.2	8.6
20-24	202,680	72,342	15.7	48.3
25-29	186,723	61,055	33.1	89.3
30-34	180,922	48,283	48.3	68.8
35-44	277,847	65,966	14.7	9.6

Despite substantial gains in the past, North Carolina still ranks among the poorest states in terms of personal income and family poverty (7). In addition, both the U.S. and N.C. poverty rates have risen since the mid-seventies, according to a March 1983 report prepared by the N.C. Division of Economic Opportunity (8). The increase is hitting hardest at households headed by women and the elderly, the report says, with the state's rate rising a full point between 1980 and 1981 to an estimated 16.4 percent of the population. The corresponding U.S. rate was 14.0 percent.

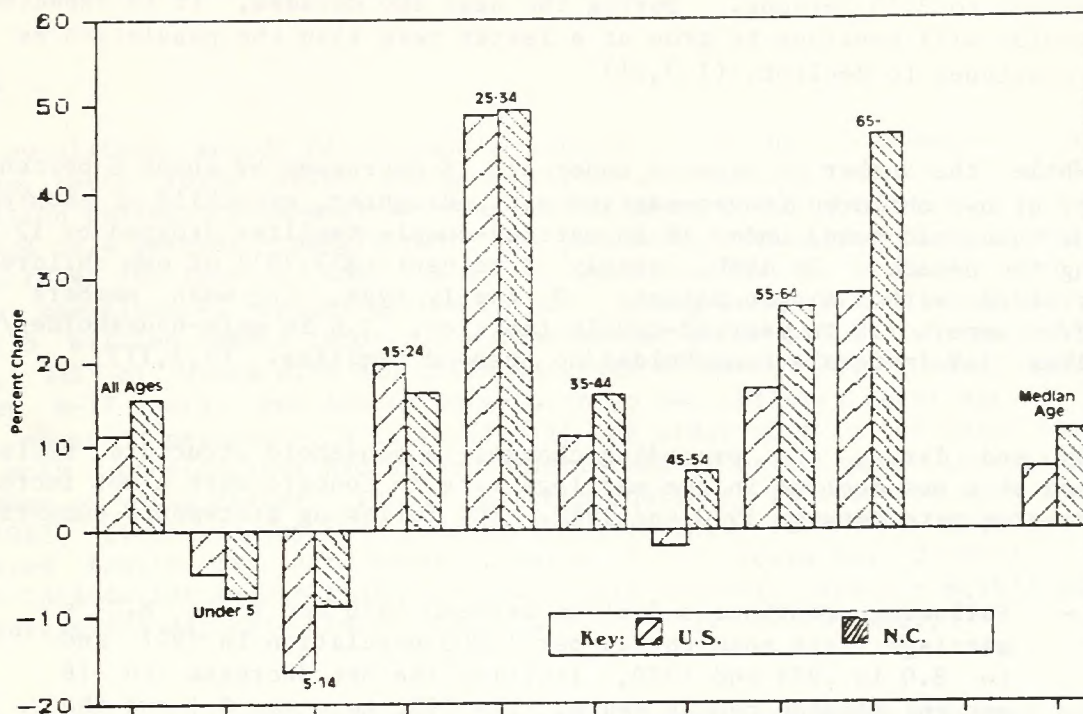
Educational attainment also remains below average in North Carolina. Despite notable improvements that have raised school enrollment to above-average levels, only 3 other states had a lower percentage of high school graduates among persons 25 and older in 1980 (7,10,17).

#### Households

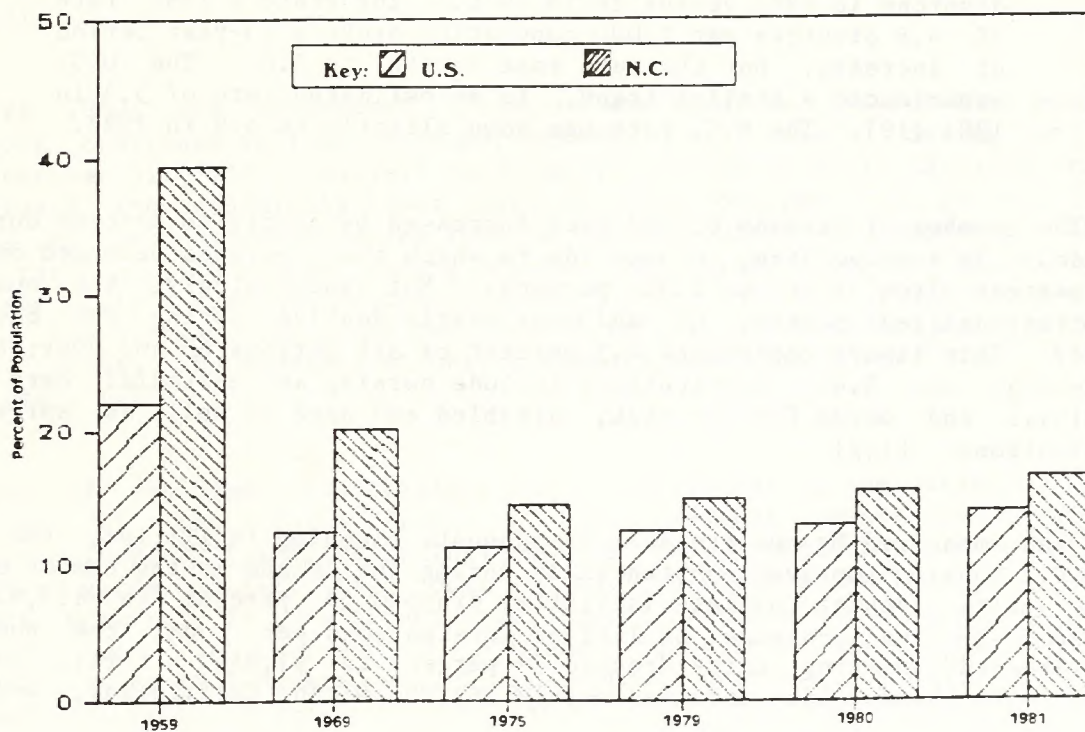
The number of N.C. households increased 35 percent during the last decade, to 2,043,291 on April 1, 1980. At the same time, the number of families (households in which the head is related to at least one other member) increased 23 percent to 1,576,622 with the number of married-couple families increasing 17 percent to 1,287,933. The number of 1-person households more than doubled, to 407,650 in 1980. (1,2)

The number of persons in nonfamily households nearly doubled during the decade to 533,159 (11,18). This includes persons the Census Bureau now terms POSSLQs--persons of opposite sex sharing living quarters.

**Population Change by Age**  
**United States and North Carolina 1970-1980**



**Percent of Population in Poverty**  
**United States and North Carolina 1959-1981**





As a result of the much greater increase in number of households (35%) than in population (16%), the average size of N.C. households declined about 14 percent to 2.78 persons in 1980. The average size of family households declined 9 percent to 3.25 persons. During the next two decades, it is expected that households will continue to grow at a faster rate than the population as family size continues to decline. (1,3,11)

While the number of persons under age 18 decreased by about 6 percent, the number of own children (never-married son, daughter, stepchild or adopted child of the household head) under 18 in married-couple families dropped by 12 percent during the decade. In 1980, nearly 17 percent (277,791) of own children under 18 resided with a single parent. By family type, the mean numbers of own children were: 1.8 in married-couple families, 1.6 in male-householder/no wife families, 1.9 in female-householder/no husband families. (1,2,11)

By and large, the preceding changes in household structure reflect the effects of a net decline in the marriage rate in concert with a net increase in the divorce rate between 1970 and 1980. The following statements summarize:

- Following continuous decline between 1970 and 1976, N.C.'s marriage rate rose to 7.9 per 1,000 population in 1977 and to 8.0 in 1979 and 1980, limiting the net decrease to 16 percent between census years. The 1981 rate was 8.1 and the 1982 rate, 8.5.
- For each 100 marriages in North Carolina, there were 62 divorces in 1981 versus 28 in 1970. The state's 1980 rate of 4.8 divorces per 1,000 population broke a 13-year period of increase, but the rate rose in 1981 to 5.0. The U.S. experienced a similar trend, to an estimated rate of 5.3 in 1981 (19). The N.C. rate was down slightly to 4.9 in 1982.

The number of persons 65 and over increased by nearly 46 percent during the decade. In average size, households to which these persons belonged decreased 22 percent from 1.66 to 1.30 persons. Not surprisingly, the number of institutionalized persons 65 and over nearly doubled during the decade to 27,287. This figure represents 4.5 percent of all persons 65 and over; the 1970 percentage was 3.4. Institutions include nursing and custodial care homes, hospitals and wards for the sick, disabled and aged as well as correctional institutions. (1,2)

When measured by the presence of adequate plumbing facilities, the quality of N.C. housing improved substantially during the decade as the number of year-round units lacking complete facilities dropped 54 percent to 115,928. As measured by the presence of 1.01 or more persons per room, the number of "overcrowded" housing units dropped 39 percent to 91,854. Still, in 1980, overcrowded households involved nearly 564,000 North Carolinians, and among



them, nearly 90,000 were also without complete plumbing for the household's exclusive use. (2,10)

### Workers

A population sector of increasing concern to the health community is the civilian labor force which changed rather dramatically in both size and composition during the seventies. The number of employed civilians 16 and older increased 31.4 percent - nearly twice the population increase - to 2.76 million. The increase for females (45%) was about twice that for males (22%) such that females comprised 45 percent of the force. Among women 16 and older in 1980, the 1.25 million female labor force represented about 54% of whites, 55% of blacks, 58% of women with own children under 6 years, 70% of women with own children 6-17 years, and 48% of women with no own children under age 18. In total, about 55 percent of N.C. females 16 and older were in the labor force in 1980; only 2 other states had an appreciably higher percentage. Concomitantly, the number of young children in day care has continued to increase such that, in July 1982, licensed day care centers numbered 2,223 (capacity 82,669) while registered family day care homes numbered 5,408 (capacity 27,040). These figures include 184 federally-funded Head Start Centers (capacity 6,265) and 545 other subsidized day care centers (capacity 17,775). (7,10,11,21)

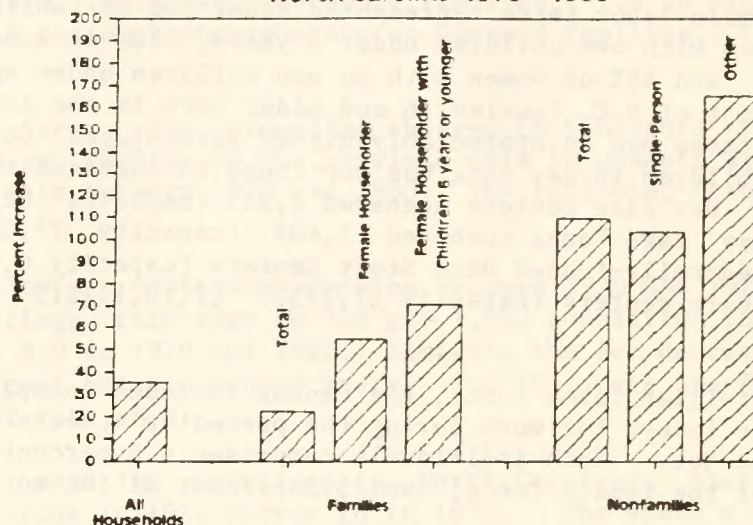
In counting the civilian labor force, the census includes unemployed persons 16 and older who have looked for work during the preceding 4 weeks and who are available to accept a job. Such individuals comprised 4.8 percent of the male force, 6.3 percent of the female force, and 5.5 percent of the total force in 1980. (11)

After 1980, the employment situation worsened as unfavorable economic conditions continued to lower consumer demand. As a result, during the year ended October 31, 1982, durable goods manufacturing in North Carolina dropped 7.7 percent and nondurable goods manufacturing dropped 5.3 percent. The trimming of production schedules reduced total manufacturing employment at an annual rate of 11.8 percent during October 1982 while, for the entire labor force, the state's seasonally-adjusted unemployment rate during October was 10.1 percent, the highest rate since the 1974-75 recession. However, as this report goes to press, the economic situation appears much more hopeful than in the recent past. (22)

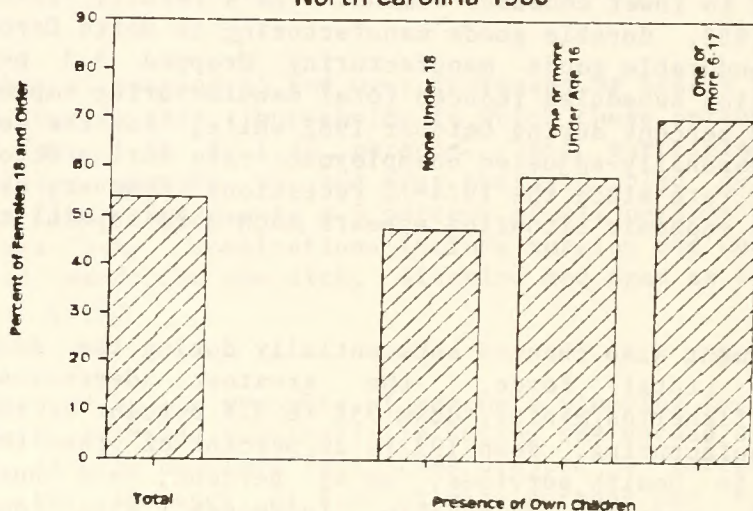
Types of employment also changed substantially during the decade. As a percentage of the total force, the greatest decreases were in agriculture/forestry/fisheries/mining, down 35% to 3.6 percent of the total, and nondurable goods manufacturing, down 19% to 20 percent of the total. Major increases occurred in health services, up 45 percent, and business/repair services, up 38 percent. Notable increases also occurred in finance/insurance/real estate, up 20%; educational services, up 18%; and durable goods manufacturing and public administration, each up 17 percent. (10,11)

Concerning the state's manufacturing industries, the percentage of nonagricultural workers employed in manufacturing was higher in North Carolina than in any other state in 1980; in contrast, average hourly and weekly earnings of those workers were lower than in any other state (5). Healthwise, it is also noted that an unusually large number of the state's manufacturers are small enough to be exempt from rigorous safety regulations and that, among states, North Carolina ranks eleventh in generating hazardous waste and fourth in low-level radioactive waste (3).

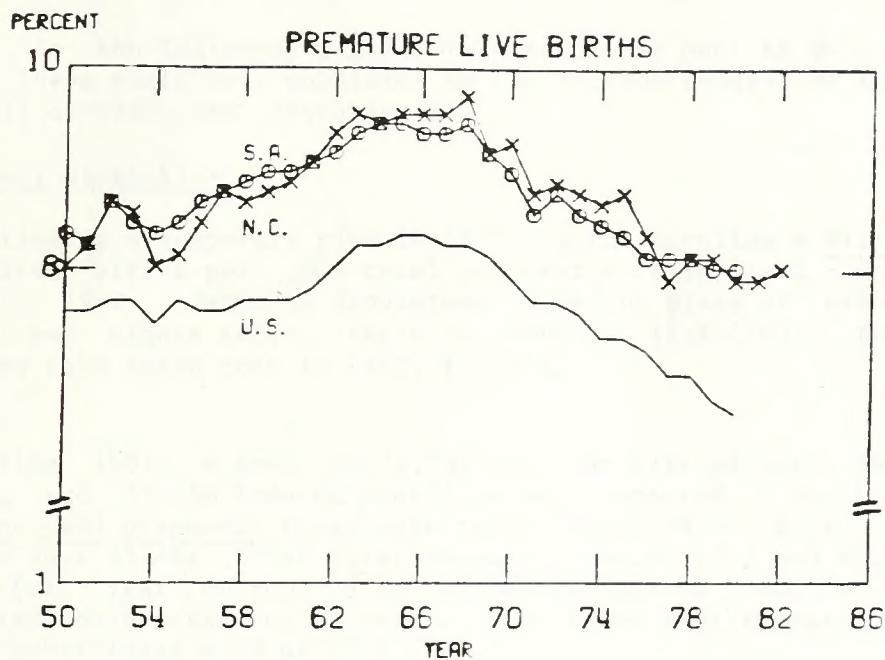
Household Count Increase by Type  
North Carolina 1970-1980



Females in the Labor Force  
North Carolina 1980







## IMPORTANT HEALTH EVENTS AND THEIR CONTROLLING FACTORS





## IMPORTANT HEALTH EVENTS AND THEIR CONTROLLING FACTORS

(Note: In the following pages, references are made to U.S. health goals for 1990. These goals were published by the Surgeon General of the United States in the Fall of 1980; see reference 15.)

### Pregnancy Statistics

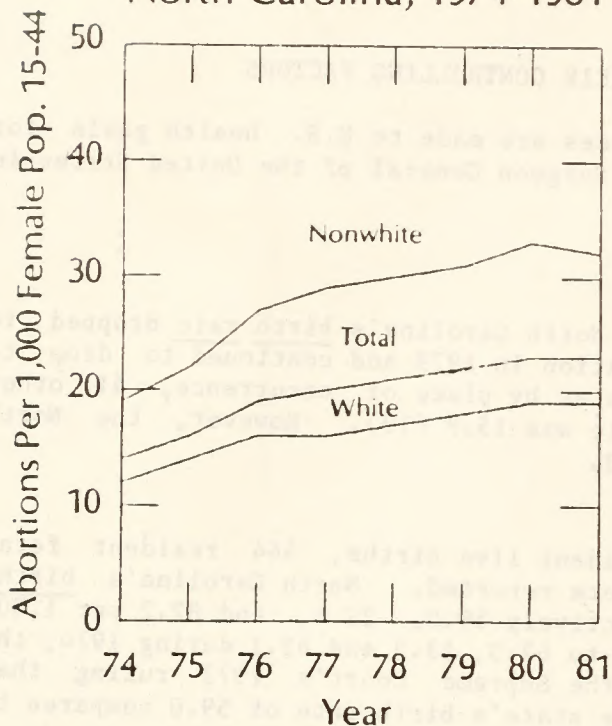
Following a temporary rise in 1977, North Carolina's birth rate dropped to 14.4 live births per 1,000 total population in 1979 and continued to drop to 14.1 in 1981. Based on provisional rates by place of occurrence, 41 other states had higher rates; the U.S. rate was 15.9 (19). However, the North Carolina rate again rose in 1982, to 14.3.

During 1981, a total of 83,752 resident live births, 864 resident fetal deaths, and 32,050 induced abortions were reported. North Carolina's birth, abortion and pregnancy rates were respectively 59.0, 22.6, and 82.2 per 1,000 females ages 15-44. Those rates compare to 67.9, 13.3 and 82.1 during 1974, the first full year of reports following the Supreme Court's 1973 ruling that legalized the practice of abortion. The state's birth rate of 59.0 compares to a U.S. provisional rate of 67.6 (19).

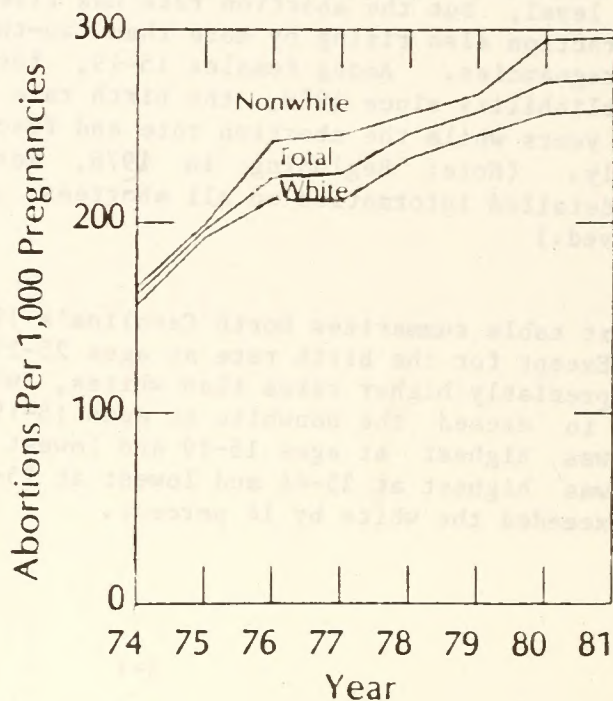
As shown by the above comparisons, the state's pregnancy rate remains at its 1974 level, but the abortion rate has risen by over two-thirds with the abortion fraction also rising by more than two-thirds to 275 abortions per 1,000 reported pregnancies. Among females 15-19, for whom abortion estimates are of greatest reliability since 1978, the birth rate decreased 12 percent during the last three years while the abortion rate and fraction rose by 10 and 18 percent respectively. (Note: Beginning in 1978, more facilities are voluntarily reporting detailed information on all abortees; thus, estimates for age groups have improved.)

The next table summarizes North Carolina's 1981 pregnancy statistics by race and age. Except for the birth rate at ages 25-29 and 30-34, nonwhites continued to have appreciably higher rates than whites, while the white abortion fraction continued to exceed the nonwhite at ages 15-19. For whites, the abortion fraction was highest at ages 15-19 and lowest at ages 30-34; the nonwhite fraction was highest at 35-44 and lowest at 25-29. In total, the nonwhite fraction exceeded the white by 14 percent.

# Abortion Rates By Race North Carolina, 1974-1981



# Abortion Fractions By Race North Carolina, 1974-1981





Pregnancy, Live Birth and Abortion Rates with Abortion Fractions by Race and Age  
North Carolina 1981

Age	Pregnancy Rates <sup>1,2</sup>		Live Birth Rates <sup>2</sup>		Abortion Rates <sup>2</sup>		Abortion Fractions <sup>3</sup>	
	White	Nonwhite	White	Nonwhite	White	Nonwhite	White	Nonwhite
15-19	76.3	125.9	42.6	86.4	33.3	38.1	435.8	302.7
20-24	128.8	173.6	95.6	123.2	32.4	49.0	251.3	282.2
25-29	111.9	124.9	94.8	92.0	16.4	31.6	147.0	253.3
30-34	58.0	68.8	49.5	49.8	8.2	18.2	141.3	264.2
35-44	10.3	18.6	7.3	12.4	2.9	5.9	280.6	318.6
All ages								
15-44	73.1	107.4	53.7	74.6	18.9	31.7	258.6	295.5

<sup>1</sup>Pregnancies are the sum of reported live births, fetal deaths and induced abortions. <sup>2</sup>Per 1,000 women. <sup>3</sup>Per 1,000 pregnancies.

North Carolina's 1980 abortion rate of 22.9 compares to a 1980 U.S. estimate of 29.4, according to the Alan Guttmacher Institute (AGI). The AGI estimates that 27 states had higher abortion rates than North Carolina during 1980. (23)

U.S. health goals for 1990 (15) indicate that the percentage of abortions performed after the first trimester should be reduced by about 3.2 percent per year to 6.0. In North Carolina, a comparable percentage decrease would reduce the statewide percentage from 10.6 in 1980 to 7.2 in 1990.

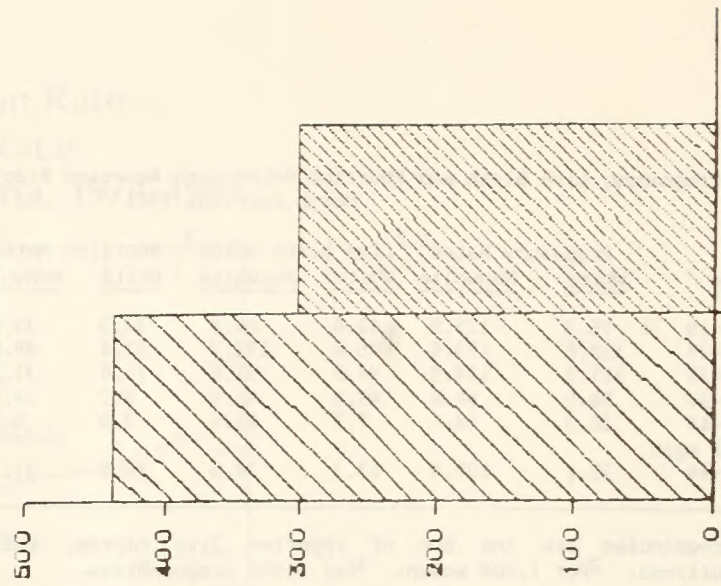
Teenage pregnancy continues to be a major concern in North Carolina. While birth rates have declined, pregnancy rates for girls 15, 16, and 17 years old were up about 47, 16, and 2 percent respectively between 1970 and 1980. Altogether, reported pregnancies to mothers under age 20 numbered 25,199 during 1981; 9,813 or nearly two out of five were induced abortions.

Based on the Surgeon General's health goals for 1990 (15), the United States is expected to achieve the following average annual decreases in its teenage birth rates: 10% below age 15, 2.5% at age 15, 1.8 at age 16 and 1.1% at age 17. At comparable rates of improvement, the state's 1980 and 1990 birth rates and the U.S. goals for those ages appear as follows:

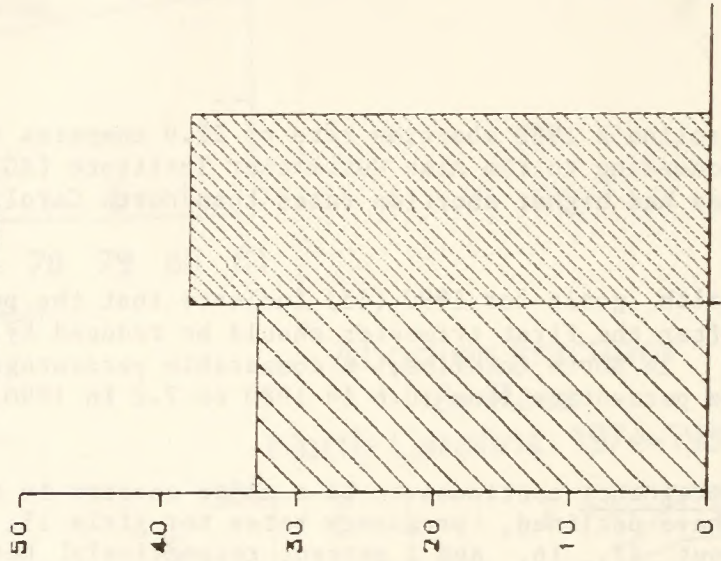


Live Birth Rates, Abortion Rates, and  
Abortion Fractions by Race: Females 15-19 Years Old, North Carolina 1981

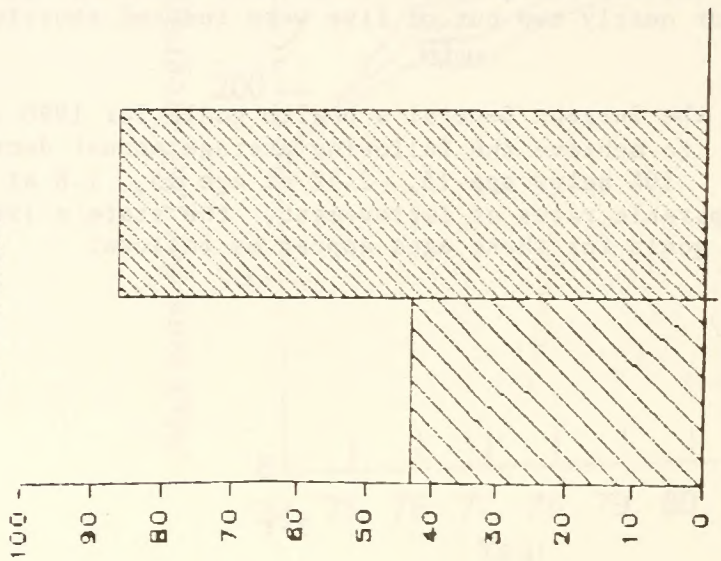
Abortion Rate



Abortion Fraction



Live Birth Rate



Key:  Whites  Nonwhites

# Live Births per 1,000 Females

<u>Age of Mother</u>	<u>N.C. 1980</u>	<u>N.C. 1990 Projected</u>	<u>U.S. 1990 Goal</u>
Under 15	1.6	virtually zero	virtually zero
15	17.6	13.2	10.0
16	38.1	31.2	25.0
17	59.5	53.0	45.0

In addition to the above, North Carolina's health community must be concerned about the number of repeat pregnancies among teenagers, particularly unmarried mothers under age 18. In 1981, a total of 570 unmarried females under 18 experienced a second or higher-order live birth or fetal death. Those events are included in a list of "sentinel health events" (24) identified by state health officials as being the minimum set about which the health community should ask, "Why did they happen?" In addition to those pregnancies, repeat abortions are a matter of concern with one out of four or 8,200 abortees during 1981 reporting at least one previous procedure and 368 reporting at least three. Among those repeaters were 1,452 teenagers.

In both the state and the nation, the number and percentage of live births out of wedlock rose steadily during the last decade. The N.C. 1981 percentages were 6.5 for whites and 46.4 for nonwhites with the number of births out of wedlock totaling 16,210. The U.S. percentages were 11.0 for whites and 48.4 for nonwhites in 1980 (25).

In North Carolina, the increase in births out of wedlock appears entirely due to growth in the number of unmarried women of childbearing age. The rate of childbearing by unmarried women actually dropped during the decade, by 5.6 percent to 10.1 for whites and by 20.7 percent to 65.2 for nonwhites in 1980. These changes compare to an overall 32 percent decline in the number of births per 1,000 women ages 15-44.

Notable changes in the percentage distributions of North Carolina births also include reduced percentages of mothers with other maternal risk factors, i.e., young and old age, low educational attainment, high parity and previous loss of a liveborn infant. Still, in 1981, one of every two live births involved at least one of the maternal characteristics associated with high infant mortality. Those events represented 43 percent of white births and 72 percent of nonwhite births. (Note: See table on page 3-10 for identification of the eight maternal characteristics.)

Between 1970 and 1980, the North Carolina percentage of live births 2,500 grams or less declined about 1.4 percent per year to 7.9; the nonwhite decrease was about 1.6 percent annually to 11.8. Still, only 7 states experienced higher percentages than N.C.'s in 1980 (25).



By 1990, the U.S. expects an average annual decline of 2.5 percent to a premature rate of 5.0 percent, not to exceed 9.0 in any race/ethnic group or county (15). Comparable percentage reductions would bring North Carolina's rate to 5.9% overall and to under 9.0% for nonwhites and nearly all counties.

In addition to birth weight and maternal characteristics, Apgar scores and congenital malformations are reported on the birth certificate. Consistent with levels of prematurity, 5-minute Apgar scores below 7 were twice as prevalent among nonwhites (12%) as whites (6%) during 1981. Except for supernumerary digits, reported malformations were more prevalent among whites (0.76% versus 0.51%). U.S. health goals developed by the Health Resources Administration (26) call for reductions in neural tube defects, Rhesus hemolytic disease, and fetal alcohol syndrome. Of these, only neural tube defect is reported in North Carolina; 73 infants were born with those defects during 1981.

Since reporting began in 1974, North Carolina's prenatal care levels have improved. The percentage of white mothers receiving no care prior to the fourth month declined about 22 percent to 16.7 in 1980; the nonwhite percentage dropped by about 20 percent to 37.4. If North Carolina and all counties achieved the 1980-90 percentage improvement expected for blacks nationally (15), the state's nonwhite percentage would be reduced by an additional 6.3 percent per year to 13.8 and about one-fourth of the counties would still have more than 10 percent of mothers receiving late or no prenatal care. In 1980, all but one county exceeded that 10-percent level (4).

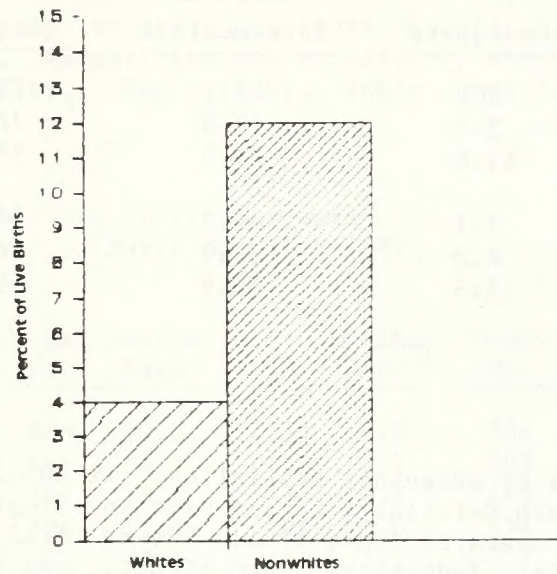
Prenatal care levels among teenagers are a particular concern since those mothers are often at high risk of a morbid pregnancy outcome. During 1981, 43 percent of mothers 15-19, versus 23 percent of all mothers, received no care prior to the fourth month (if at all); 27 percent of mothers 15-19, versus 15 percent of all mothers, had less than eight prenatal care visits.

A Prenatal Care Index has been developed to take into account month of first visit, number of visits and gestational age at delivery (27). The following table provides single- and five-year percentages by level of care. Only about one of two nonwhites appears to have had adequate care with whites having a decided advantage over nonwhites. For both races, levels of care are gradually improving.

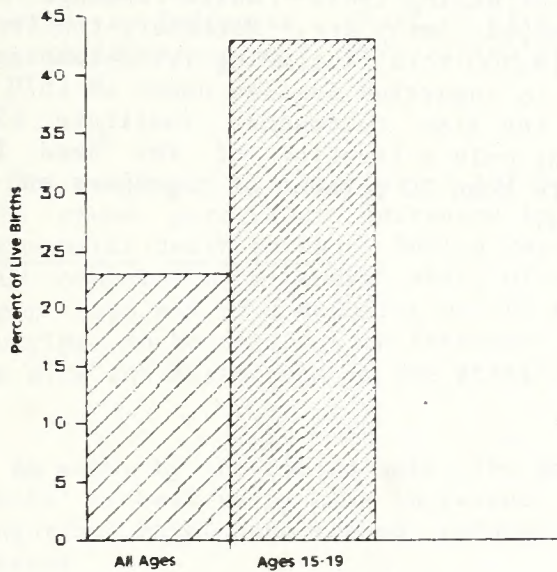


# Levels of Prenatal Care North Carolina 1981

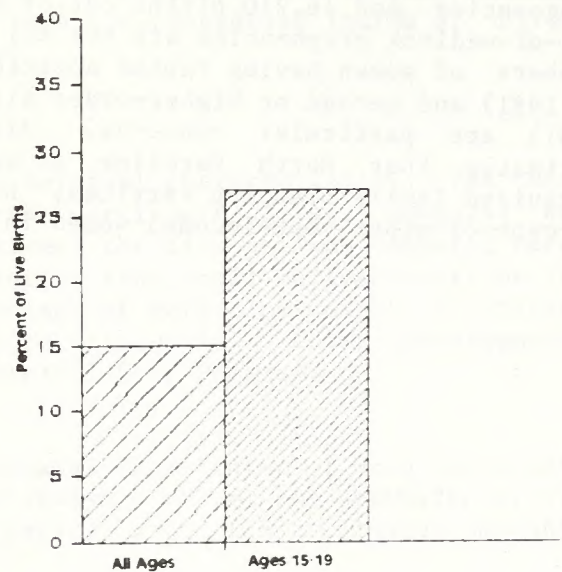
Inadequate Care\*



Late or No Care†



Less Than Eight Visits



\*Based on a prenatal care index that takes into account month of first visit, number of visits, and gestation at delivery (27).

†Late care defined as visit after third month.

Percentage Distributions of Mothers by Level of Prenatal Care  
North Carolina

	<u>Inadequate</u>	<u>Intermediate</u>	<u>Adequate</u>	<u>Total</u>
1981	6.4	23.2	70.4	100.00
Whites	3.8	17.8	78.4	100.00
Nonwhites	11.8	34.5	53.7	100.00
1977-81	7.1	24.7	68.2	100.00
Whites	4.2	18.9	76.9	100.00
Nonwhites	13.3	36.9	49.8	100.00

Finally in the area of pregnancy statistics, we should underscore those of greatest concern to North Carolina's family planning program, which the Division of Health Services has operated since 1968. "Every child a wanted child" is the concept underlying that federally-funded effort, and the number of active patients continues to grow, to 100,850 as of December 31, 1982 (28). Yet, unwanted pregnancy remains a major problem in North Carolina as indicated by a number of statistics examined in this report. Among those indicators of unwanted pregnancy are reports of 32,050 induced abortions, 25,199 teenage pregnancies and 16,210 births out of wedlock during 1981. While teenage and out-of-wedlock pregnancies are not all unwanted, many are. Moreover, the large numbers of women having repeat abortions (8,200 total including 1,452 teenagers in 1981) and second or higher-order births to unmarried females under 18 (570 in 1981) are particular concerns. Also, the Alan Guttmacher Institute (29) estimates that North Carolina is meeting only a fraction of the need for organized family planning services, no more than 20 percent of teenagers and 33 percent of other (low-income) women in 1980.



## Mortality

Despite substantial improvement during the seventies, infant death continues to be a major concern of North Carolinians. The state's 1979 infant and neonatal rates were each exceeded by those of only 5 other states (30). Provisionally, the N.C. infant rate was exceeded by those of 4 states in 1980 and 7 states in 1981 (19). The following table summarizes the state's 1981 experiences:

Birth Outcomes  
North Carolina 1981

Race of Infant	Live Births	Fetal Deaths <sup>1</sup>		Neo. Deaths <sup>2</sup>		Post. Deaths <sup>3</sup>		Infant Deaths <sup>4</sup>	
		No.	Rate	No.	Rate	No.	Rate	No.	Rate
All Races	83,752	864	10.2	739	8.8	364	4.4	1,103	13.2
White	56,756	466	8.1	405	7.1	203	3.6	608	10.7
Nonwhite	26,996	398	14.5	334	12.4	161	6.0	495	18.3
Black	24,756	376	15.0	321	13.0	154	6.3	475	19.2
Am. Indian <sup>5</sup>	1,532	11	7.1	11	7.2	7	4.6	18	11.7

<sup>1</sup> Fetal deaths per 1,000 deliveries. <sup>2</sup> Deaths under 28 days per 1,000 live births. <sup>3</sup> Deaths 28 days to 1 year per 1,000 neonatal survivors. <sup>4</sup> Deaths under 1 year per 1,000 live births. <sup>5</sup> There is evidence that infants are not reported as Indian at death as often as they are considered Indian at birth. Thus, Indian rates may be artificially low.

For selected categories of infant and maternal characteristics, the next table shows percentage decreases in North Carolina's fetal, neonatal and postneonatal death rates. During years between the time periods compared here, there occurred a) a general shift of deliveries from small delivery services to larger ones and b) a doubling of the percentage of very low-weight deliveries occurring in hospitals with intensive newborn care units. Those developments were with the assistance of the state's Perinatal Care Program.

As shown by the tabled data, the postneonatal death rates of very low-weight infants of both races have increased. Otherwise, whites and nonwhites of all categories have experienced reduced mortality with the following notable patterns:

- For both races, modest declines in fetal mortality and moderate declines in neonatal mortality occurred among infants weighing 1500 grams or less at birth.

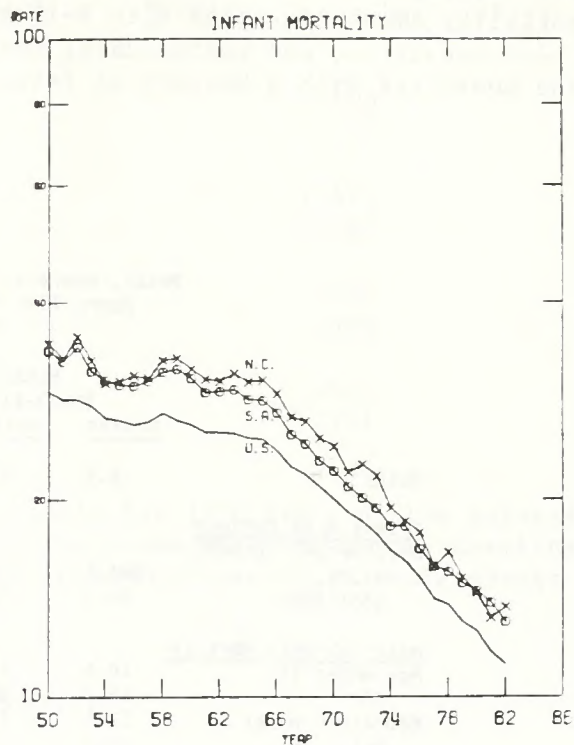
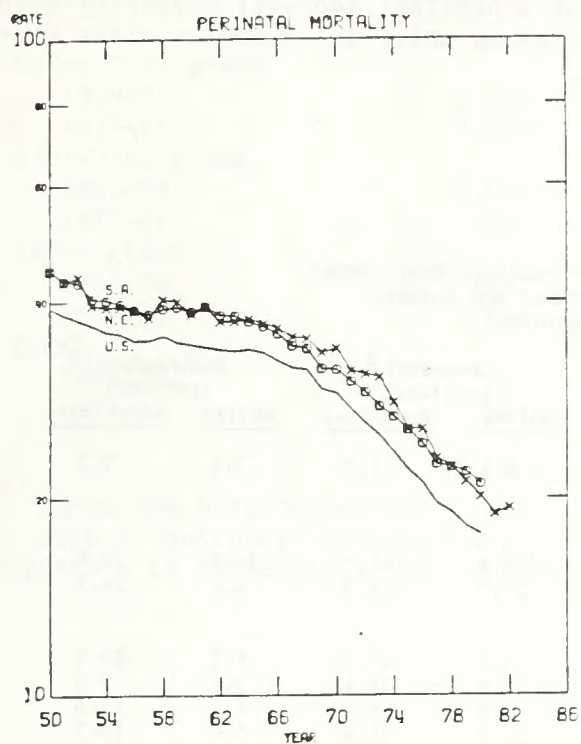


- For both races, notable reductions in neonatal mortality occurred among infants weighing 1501-2500 grams at birth; each race-specific rate declined by more than one-half.
- Among infants weighing over 2500 grams at birth, reductions in fetal and neonatal mortality were greater for nonwhites than for whites.
- For both races, reductions in all three types of mortality rates were generally high among older mothers, mothers experiencing a fourth or higher-order birth, and mothers with a history of fetal loss.
- Except as noted above, fetal and neonatal reductions were greater for whites while postneonatal reductions were far greater for nonwhites. Unmarried white mothers experienced virtually no improvement in postneonatal loss.

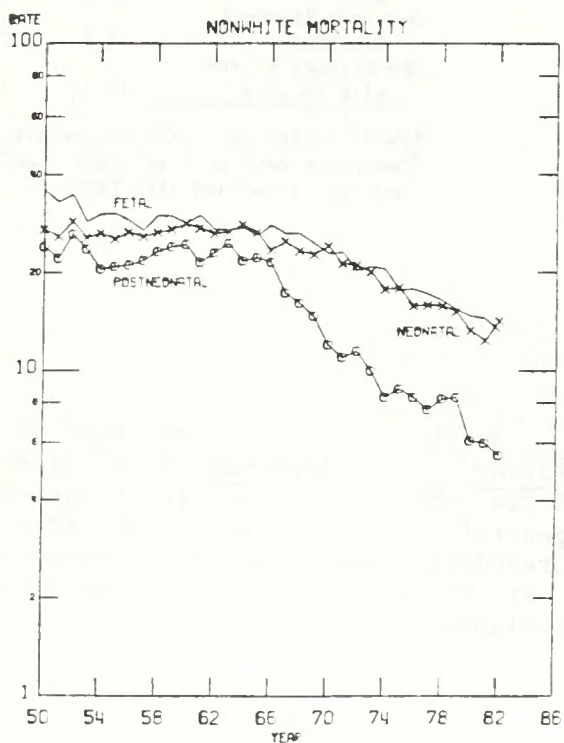
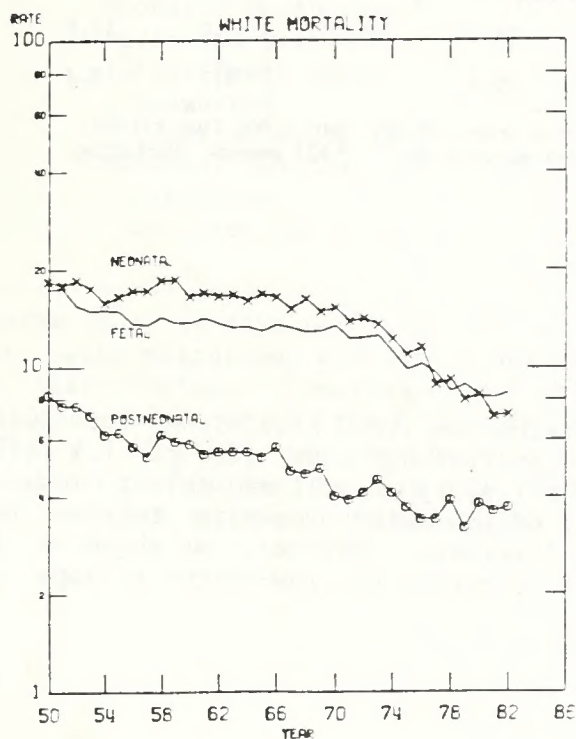
Percentage Decreases in Fetal, Neonatal and Postneonatal Death Rates  
North Carolina

	Fetal (1969-73 vs 1977-81)		Neonatal (1969-73 vs 1977-81)		Postneonatal (1969-72 vs 1977-80)	
	Whites	Nonwhites	Whites	Nonwhites	Whites	Nonwhites
Total	32.8	30.4	43.0	33.2	12.8	35.1
Birth Weight (grams)						
<1501	15.5	13.8	29.9	25.9	+47.8	+28.7
1501-2500	36.3	31.3	55.4	53.0	19.0	33.8
2501+	31.1	45.6	39.5	48.0	18.2	40.9
Age of Mother						
<18*	23.2	22.6	44.6	29.5	11.4	22.2
18-34	31.7	27.1	42.5	32.7	13.5	38.0
35+*	35.8	44.3	38.4	42.6	37.8	40.5
Education of Mother						
<9*	26.2	33.6	46.0	29.0	4.5	28.8
9-11*	25.0	26.3	39.1	30.6	12.3	23.0
12+	31.9	25.4	41.0	32.8	3.8	31.3
Out of Wedlock						
Yes*	33.3	29.7	38.9	33.1	1.6	30.2
No	33.1	32.5	43.9	35.6	15.8	42.7
Birth Order						
1	29.2	28.3	39.4	27.6	12.1	19.0
2-3	29.0	20.4	44.1	40.8	5.1	39.4
4+*	39.3	36.8	42.0	25.1	32.8	44.9
Previous Fetal Death						
Yes*	39.3	34.3	44.0	34.9	30.2	37.0
No	31.0	31.5	43.5	34.8	10.8	34.8
Previous Liveborn Now Dead						
Yes*	39.4	22.7	36.7	13.9	25.0	31.2
No	31.5	29.6	41.8	33.3	13.2	34.6
*One or more of the risk factors	29.6	29.3	41.2	31.8	14.5	34.4

# Perinatal and Infant Mortality North Carolina, South Atlantic Area, and United States



## Fetal, Neonatal and Postneonatal Mortality North Carolina





Thus, some problems remain, particularly excessive infant loss among women characterized by one or more of the so-called risk factors. The next table points up those excesses. On a race-specific basis, rates have been reduced to the average rate (the race-specific total rate) only in the case of fetal mortality among nonwhites with 9-11 years of schooling, neonatal mortality among older nonwhites, and postneonatal mortality among white and nonwhite older women and nonwhites with a history of fetal loss.

Fetal, Neonatal and Postneonatal Death Rates  
Among High-Risk Infants and Mothers  
North Carolina

	Fetal <sup>1</sup> (1977-81)		Neonatal <sup>2</sup> (1977-81)		Postneonatal <sup>3</sup> (1977-80)	
	Whites	Nonwhites	Whites	Nonwhites	Whites	Nonwhites
Total <sup>4</sup>	8.6	15.6	8.1	14.7	3.4	7.2
<u>Infant Risk Factors</u>						
Birthweight (grams)						
<1501	284.1	266.8	455.8	422.7	54.1	70.8
1501-2500	30.3	30.8	27.7	18.2	9.8	14.1
<u>Maternal Risk Factors</u>						
Age under 18	10.6	17.1	13.3	17.7	6.2	10.5
35+	15.4	28.0	9.8	14.4	2.3	5.0
Education under 9	12.1	18.6	10.9	18.4	8.4	12.6
9-11	10.2	15.4	10.3	15.4	5.0	10.7
Out of Wedlock	13.8	17.5	13.8	16.2	6.2	8.8
Birth Order 4+	11.1	18.7	10.5	18.5	3.9	7.5
Previous Fetal Death	11.9	26.3	11.7	22.6	3.7	6.3
Previous Liveborn, Now Dead	13.4	24.5	24.3	35.9	6.0	11.9
One or more of the risk factors	10.7	17.4	10.4	16.3	4.7	8.4

<sup>1</sup>Fetal deaths per 1,000 deliveries. <sup>2</sup>Deaths under 28 days per 1,000 live births.

<sup>3</sup>Deaths 28 days to 1 year per 1,000 neonatal survivors. <sup>4</sup>All events, including those not involving risk factors.

North Carolina's 1981 rate of 1.7 deaths per 1,000 live births for Sudden Infant Death Syndrome (SIDS) exceeds the provisional U.S. rate of 1.4 (19). While nonwhites bear the brunt of SIDS mortality as well as infant loss in general, the greater perinatal survival of low-weight nonwhite infants (see preceding table) remains a phenomenon of interest. However, as shown by the next table, the white-to-nonwhite mortality ratios for low-weight infants are declining.



White-to-Nonwhite Mortality Ratios  
North Carolina 1969-73 and 1977-81

<u>Birthweight</u>	<u>Fetal Death Rate Ratios</u>	<u>Neonatal Death Rate Ratios</u>
Under 1501 grams		
1969-73	1.086	1.139
1977-81	1.065	1.078
1501-2500 grams		
1969-73	1.063	1.643
1977-81	.984	1.522
2501+ grams		
1969-73	.662	.760
1977-81	.838	.885
Total		
1969-73	.571	.645
1977-81	.551	.551

Among the Surgeon General's U.S. health goals for 1990 are a number related to morbid outcomes of pregnancy. Assuming improvements in North Carolina comparable to those projected nationwide, the following statistics would ensue:

Pregnancy Outcome Statistics

	<u>N.C. 1980</u>	<u>N.C. 1990 Projected</u>	<u>U.S. 1990 Goal</u>
Neonatal Death Rate <sup>1</sup>	9.9	7.6	6.5
Perinatal Death Rate <sup>2</sup>	14.3	7.3	5.5
Infant Death Rate <sup>3</sup>	14.4	10.4	9.0
Nonwhites	19.4	11.4	12.0
Counties above 12.0 <sup>4</sup>	66	<32	0
Maternal Death Rate <sup>4</sup>	5.9	3.3	5.0
Nonwhites	11.0	3.0	5.0
Counties above 5.0	5	<5	0

<sup>1</sup> Deaths under 28 days per 1,000 live births. <sup>2</sup> Defined here as late fetal deaths (28+ weeks gestation) and infant deaths under 7 days per 1,000 live births and late fetal deaths. <sup>3</sup> Deaths under 1 year per 1,000 live births. N.C. 1990 is the number that would exceed 12.0 if all counties achieved the U.S. expected reduction of 4.0% per year between 1980 and 1990. The U.S. goal appears unrealistic. <sup>4</sup> Deaths due to ICD 630-676 per 100,000 live births. Rates are highly subject to random fluctuation.

The remainder of this section concerns total and cause-specific mortality in the population at large, including infants but excluding fetal deaths. In 1981, North Carolina's total unadjusted death rate was 825.6 deaths per 100,000 population; 49,212 residents died. The nonwhite rate (844.6) exceeded the white rate (819.5) by 3 percent while the male rate (950.1) exceeded the female rate (708.3) by 34 percent. The median age at death for all decedents was 70.4 years, up from 66.4 in 1970 and 28.1 in 1914 when N.C. deaths were first centrally recorded.

While unadjusted death rates are useful in assessing levels of health care need, the actual "forces of mortality" are best described by rates that are specific or adjusted for age, race, sex and/or other external factors that cause one population group's level of mortality to differ from another's. The age-race-sex-specific death rates on the next page provide for useful comparisons of the forces of mortality within North Carolina and between the state and the entire nation. The U.S. rates are provisional (19).

Within North Carolina, the higher white than nonwhite rates at ages 15-24 largely involve motor vehicle traffic deaths at ages 15-19; white teenagers also experienced excessive suicide and cancer mortality. At ages 85 and over, the higher white rates reflect greater mortality from cardiovascular diseases and accidental falls. Interestingly, according to 1979-80 life tables for N.C. (31), the white resident's longevity advantage ends at about age 72 for males and 74 for females; thereafter, nonwhite residents have the greater life expectancy.

Comparisons of the state and national age-specific death rates indicate the following major excesses in North Carolina:

White males	Ages 55-64 (15% above U.S. rate)
White females	Ages 5-14 (23% above U.S. rate)
Nonwhite males	Ages 35-44 (31%), 45-54 (30%), 55-64 (18%), 65-74 (10%), 75-84 (14%)
Nonwhite females	Ages 0-4 (10%), 45-54 (14%)

As observed in the white-nonwhite comparisons within the state, the N.C. and U.S. rates flip-flop, from about middle to older age for white females and at older ages for others, to the North Carolinian's advantage. Thus, only in the case of females versus males is there a consistent mortality differential across all age groups.



1981 N.C. and U.S. Death Rates by Age, Race and Sex  
(Deaths per 100,000 population)

Age Group	Total		White Males		White Females	Nonwhite Males		Nonwhite Females	
	N.C.	U.S.*	N.C.	U.S.*	N.C.	N.C.	U.S.*	N.C.	U.S.*
All Ages	825.6	866.4	931.9	973.2	712.3	1007.9	889.7	696.3	630.4
0-4	324.7	299.7	275.5	298.0	246.1	514.7	522.0	415.2	379.0
5-14	31.2	30.7	34.3	38.0	25.4	44.2	41.4	23.9	30.2
15-24	106.3	107.7	161.1	154.6	54.1	147.3	183.8	47.6	65.7
25-34	135.5	137.0	151.3	174.3	62.8	308.7	345.2	145.2	138.5
35-44	262.4	227.4	266.0	262.5	141.5	753.3	575.5	278.9	274.0
45-54	650.1	578.3	755.5	700.2	346.4	1595.5	1228.5	713.4	623.8
55-64	1489.7	1335.5	1955.7	1695.6	795.5	3055.8	2586.0	1461.6	1417.0
65-74	3066.4	2937.9	4231.1	3950.8	1923.4	5055.9	4586.3	2854.2	2725.3
75-84	6403.7	6421.6	8637.5	8590.3	5004.8	9061.6	7914.6	5605.2	5301.1
85+	14478.6	15329.8	17129.5	18520.2	14284.2	14386.0	15306.5	10675.9	11926.8

\*Data are provisional (19).

The Health Resources Administration of the Public Health Service has developed national goals for age-specific death rates (26). At comparable rates of improvement, North Carolina might expect the following:

#### Deaths per 100,000 Population

	N.C. 1980	N.C. 1990 Projected	U.S. 1990 Goal
Ages 1-14	39.4	32.3	34
Ages 15-24	118.7	96.1	93
Ages 25-64	555.2	449.7	400

The next table provides 1981 unadjusted and age-adjusted death rates by cause for N.C. and the U.S. Again, U.S. rates are provisional (19); and users are advised not to compare age-adjusted rates to unadjusted rates since the two rates reflect quite different age structures.

#### 1981 Unadjusted and Age-adjusted Death Rates by Cause

<u>Underlying Cause of Death</u>	<u>Unadjusted Rates</u>		<u>Age-adjusted Rates</u> <sup>1</sup>	
	N.C.	U.S. <sup>2</sup>	N.C.	U.S. <sup>2</sup>
All Causes	825.6	866.4	609.1	572.0
Diseases of Heart	306.5	330.6	211.7	196.4
Cerebrovascular Disease	79.1	71.7	49.0	38.5
Atherosclerosis	9.7	12.5	5.0	5.2
Cancer	166.1	184.3	129.6	132.0
Diabetes Mellitus	13.4	15.2	10.0	9.9
Pneumonia/Influenza	23.8	23.7	14.5	12.4
Chronic Obstructive Lung Disease	21.8	26.1	15.6	16.7
Chronic Liver Disease/Cirrhosis	11.0	12.9	10.5	11.5
Nephritis/Nephrosis	8.6	7.6	5.9	4.5
Motor Vehicle Accidents	25.6	22.8	25.2	22.2
Other Accidents and Adverse Effects	24.7	21.7	21.4	18.2
Suicide	12.9	12.3	12.6	11.7
Homicide/Legal Intervention	10.5	10.7	10.7	10.8

<sup>1</sup>Deaths per 100,000 population, computed by the direct method using 10-year age groups and the U.S. 1940 total population as the standard. Do not compare these rates<sup>2</sup> to the unadjusted rates or to any other rates not comparably adjusted. <sup>2</sup>Provisional rates (19).



Based on the unadjusted rates, North Carolina's health care needs do not appear unduly great except for those related to cerebrovascular disease, nephritis/nephrosis and accidents. However, once the state's more youthful age structure is taken into account via age-adjustment, mortality conditions in North Carolina appear much less favorable with only a slight advantage in the cases of cancer, chronic obstructive lung disease, and chronic liver disease/cirrhosis. Moreover, based on 1979 age-adjusted rates, even those advantages appear limited to females with North Carolina males experiencing average or greater risk. For nonwhite males, the state's 1979 age-adjusted cancer rate was higher than the nation's by 215.6 vs. 205.0. (30)

Due to underestimates of both the state and U.S. populations during the 1970s, particularly among North Carolina nonwhites, trend analyses of rates are risky. However, it does appear that cancer mortality is rising faster in North Carolina than in the U.S. Just in the last two years, the state's age-adjusted cancer death rate has risen about 2.5%, versus 0.9% nationwide (19,30). Within race-sex groups, there have been some large increases in site-specific cancer deaths; for example, the nonwhite male pancreatic cancer death rate (unadjusted) rose 36 percent between 1980 and 1981.

Total and leading site-specific cancer death rates are examined in the report, Leading Causes of Mortality 1981 (32). In age-adjusted cancer mortality, that report reveals a notable decline only in stomach cancer between 1979 and 1981. That report also summarizes survival rates and risk factors for the leading cancer sites and examines geographical patterns.

Nationwide, the rapid increase in the lung cancer death rate for women has been associated with increases in cigarette smoking which peaked during the 1950s (33). Smoking has also been indicted as a contributing factor in cancer of the pancreas as well as the bladder and kidney (34). In total, U.S. cancer mortality has declined for persons under 50 but has been increasing among persons over 50. However, the most recent data suggest that a turning point may have occurred; in particular, cancer death rates for all ages except 65-69 appear to be leveling off. (35)

In addition to rising cancer mortality, both the state and the U.S. have recently experienced increases in pneumonia/influenza and chronic obstructive lung disease mortality. N.C. decreases in cardiovascular and accident mortality also reflect national trends. However, 1979-1981 reductions in age-adjusted rates for motor vehicle and other accidents were greater in the U.S. than in North Carolina. (19,30)

According to a study by the Office of the Chief Medical Examiner (36), 61 percent of drivers killed in single-vehicle crashes in North Carolina during 1980 were legally under the influence of alcohol (blood alcohol concentration of 0.10% or more) and another 11 percent had been drinking. Corresponding percentages for drivers killed in multiple-vehicle crashes were 22 and 11

respectively. Among pedestrians killed by motor vehicles, 57 percent were legally under the influence and an additional 10 percent had been drinking.

During the past decade, arrests for driving under the influence (DUI) increased significantly in North Carolina, in fact, by nearly 35% between 1979 and 1981. During 1981, the state's DUI arrest rate of 1,619 per 100,000 population was higher than in any other state; the nationwide rate was nearly 60 percent lower at 664. The state's new Safe Roads Act -- enacted by the 1983 General Assembly and providing for increased enforcement and punishment related to "driving while impaired" -- became effective October 1, 1983. (37)

Among the 1990 health goals developed for the U.S. (15) are a number related to unadjusted mortality. North Carolina statistics relative to those goals appear as follows:

#### Deaths per 100,000 Population

	N.C. 1980	N.C. 1990 Projected	U.S. 1990 Goal
Motor Vehicle	26.7	20.3	18.0
Age under 15	9.7	7.0	5.5
Drowning	3.8	3.0	3.0
Falls	5.3	2.5	2.0
Cirrhosis of the Liver	12.2	10.9	12.0
Other drug-related (includes ICD 850-858, 950.0-950.3)	1.4	1.1	2.0
Homicide, nonwhite males 15-24	35.1	30.2	<60
Suicide, ages 15-24	11.4	10.4	<11

The table on the next page details North Carolina's 1981 race-sex-specific age-adjusted death rates by cause. The broad implications of those data are clear: there are wide gaps in the mortality risks of North Carolina males versus females and nonwhites versus whites. For example, the state's total age-adjusted rates for males of both races were nearly double the female rates, and rates for nonwhites of both sexes remained more than 40 percent above the white rates.

On the basis of somewhat arbitrary criteria, that a rate approach or exceed twice some other race-sex-specific rate and exceed the total rate by at least 25 percent, cause-specific rates among the four race-sex groups suggest the following major excesses in age-adjusted mortality:

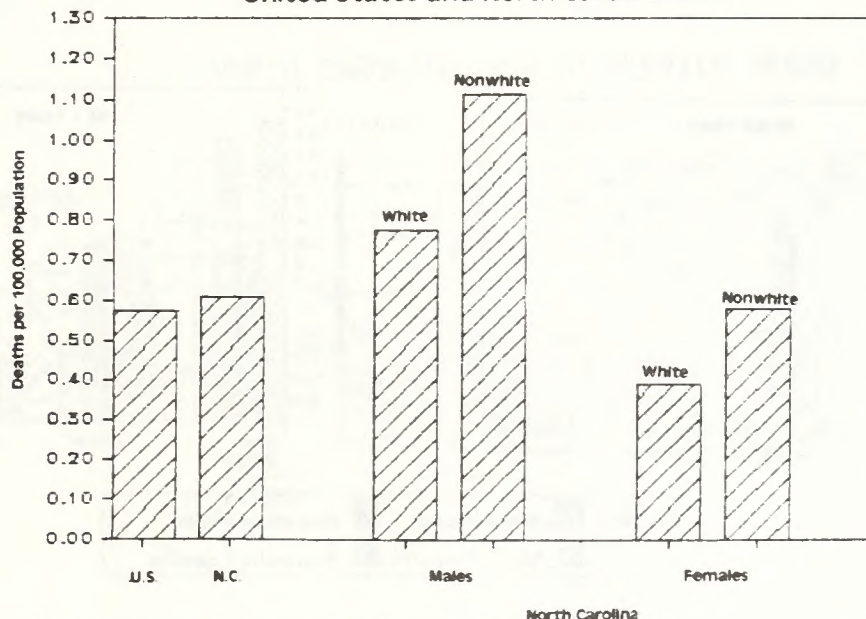


**Age-adjusted Death Rates\* by Cause  
North Carolina 1981**

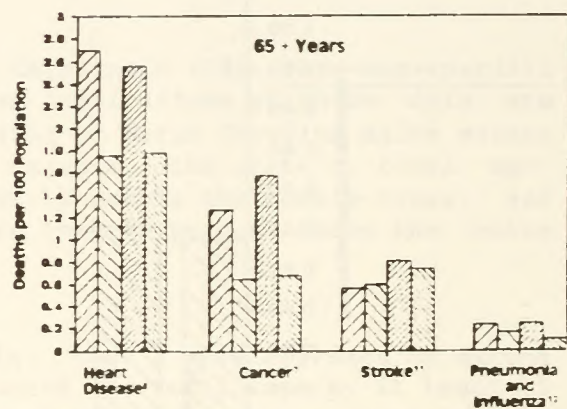
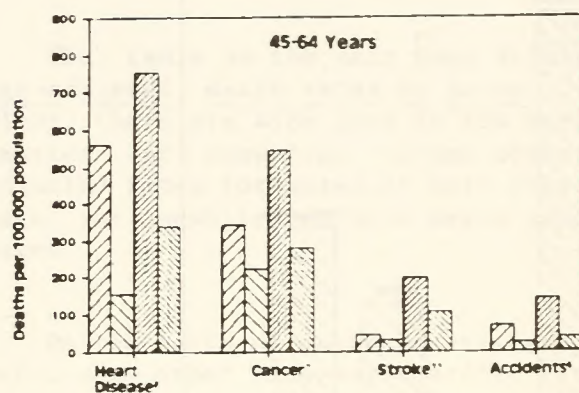
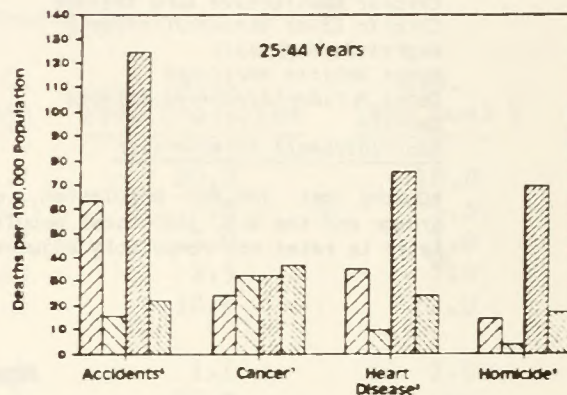
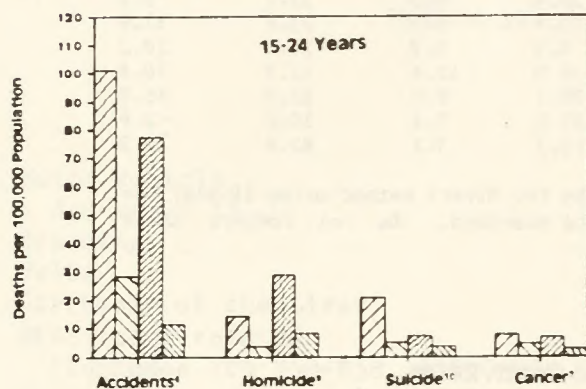
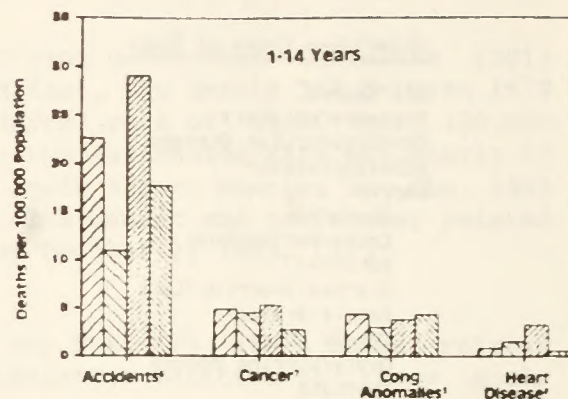
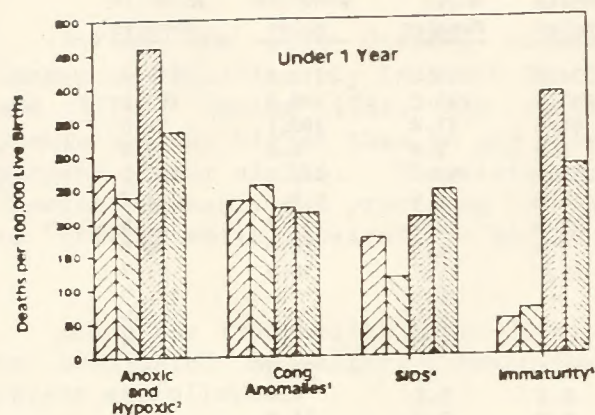
<u>Underlying Cause of Death</u>	<u>Total</u>	<u>White Males</u>	<u>White Females</u>	<u>Nonwhite Males</u>	<u>Nonwhite Females</u>
All Causes	609.1	774.2	390.0	1114.4	577.0
Diseases of Heart	211.7	297.7	129.0	340.3	182.1
Cerebrovascular Disease	49.0	45.6	37.4	100.1	69.5
Atherosclerosis	5.0	5.6	3.9	6.8	6.4
Cancer	129.6	161.1	95.7	222.9	113.1
Stomach	3.5	3.9	1.8	9.4	4.7
Colon/Rectum/Anus	12.9	14.5	10.9	17.3	12.8
Pancreas	7.3	9.5	4.5	14.0	6.9
Trachea/Bronchus/Lung	35.1	60.0	15.7	70.2	11.7
Female Breast	20.7	-	20.4	-	21.7
Cervix Uteri	4.2	-	2.9	-	9.3
Ovary/Uterine Adnexa	5.7	-	5.2	-	7.5
Prostate	18.1	14.5	-	33.2	-
Leukemia	5.2	6.2	5.0	6.4	2.7
Diabetes Mellitus	10.0	8.7	7.0	15.5	21.3
Pneumonia/Influenza	14.5	18.4	9.4	35.7	9.8
Chronic Obstructive Lung Disease	15.6	28.4	8.5	22.1	5.2
Chronic Liver Disease/Cirrhosis	10.5	13.4	5.3	21.8	11.9
Nephritis/Nephrosis	5.9	5.9	3.3	16.3	10.2
Motor Vehicle Accidents	25.2	36.6	12.4	51.3	10.4
Other Accidents/Adverse Effects	21.4	29.1	9.0	51.4	15.3
Suicide	12.6	22.0	7.4	10.8	2.6
Homicide/Legal Intervention	10.7	10.2	3.1	42.4	10.3

\*Deaths per 100,000 population, computed by the direct method using 10-year age groups and the U.S. 1940 total population as the standard. Do not compare these rates to rates not comparably adjusted.

**Age-adjusted Death Rates  
United States and North Carolina 1981**



# Death Rates for Leading Causes<sup>1</sup> by Age, Race, and Sex North Carolina 1981



Key: White Males Nonwhite Males  
 White Females Nonwhite Females

<sup>1</sup>Categories of the Ninth Revision International Classification of Diseases. ICD Codes are given in footnotes 2-12. <sup>2</sup>768-770. <sup>3</sup>740-759. <sup>4</sup>798.0. <sup>5</sup>765. <sup>6</sup>800-949. <sup>7</sup>140-208. <sup>8</sup>390-398. 402.404-429. <sup>9</sup>960-978. <sup>10</sup>950-959. <sup>11</sup>430-438. <sup>12</sup>480-487.



White males: heart disease, cancer of the pancreas and lung, leukemia, pneumonia and influenza, chronic obstructive lung disease, chronic liver disease and cirrhosis, motor vehicle and other accidents, suicide.

Nonwhite males: heart and cerebrovascular disease, cancer of the stomach, pancreas, lung and prostate, diabetes, pneumonia and influenza, chronic obstructive lung disease, chronic liver disease and cirrhosis, nephritis and nephrosis, motor vehicle and other accidents, homicide.

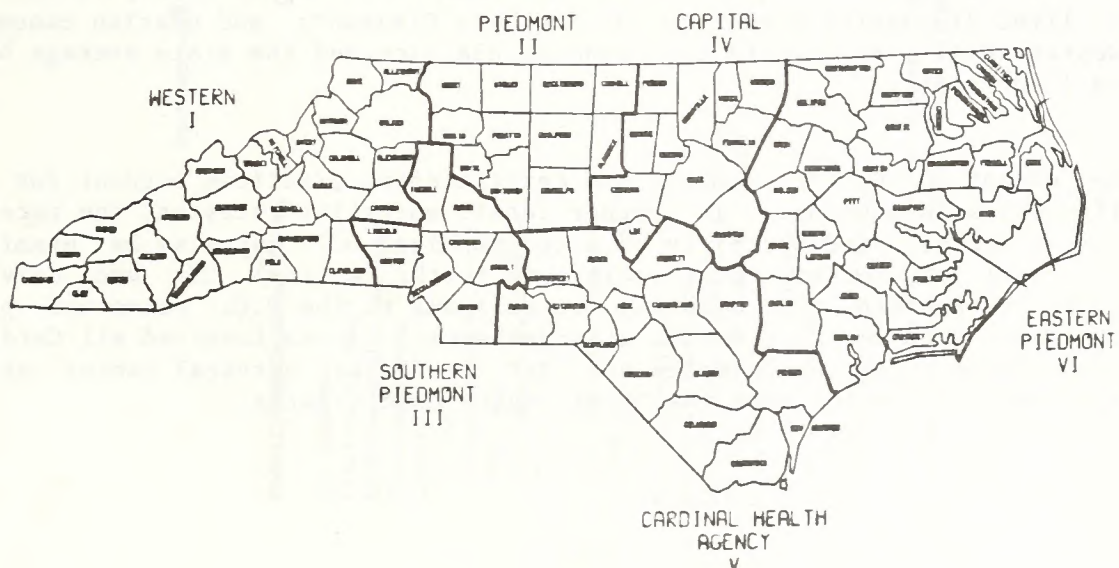
Nonwhite females: cancer of the stomach and cervix, diabetes, nephritis and nephrosis.

Compared to the above, white female excesses were small and involved higher rates than those of nonwhite females only. The causes involved were lung cancer, leukemia, chronic obstructive lung disease, and particularly suicide.

On a geographical basis, the next table shows race-sex-specific age-adjusted death rates by health service area. The data reveal nonwhite mortality risk to be greatest in the Southern Piedmont Health Service Area with white mortality risk greatest in the Cardinal and Eastern areas. Race and sex ratios show that

- race differences in mortality risk are greater in the west;
- sex differences in mortality risk are greater in the east.

### NORTH CAROLINA HEALTH SERVICE AREAS



Age-adjusted Death Rates\* by Health Service Area  
North Carolina 1981

<u>Area</u>	<u>Total</u>	<u>White Male</u>	<u>White Female</u>	<u>Nonwhite Male</u>	<u>Nonwhite Female</u>
North Carolina	609.1	774.2	390.0	1114.4	577.0
Western	547.8	731.7	366.0	1083.3	588.4
Piedmont	579.8	748.2	383.6	1035.4	604.7
Southern Piedmont	603.8	765.6	395.9	1191.0	617.5
Capital	620.9	784.9	383.5	1103.1	582.4
Cardinal	653.1	846.5	406.8	1101.5	522.5
Eastern	672.9	832.8	422.0	1151.5	579.5

\*Deaths per 100,000 population, computed by the direct method using 10-year age groups and the U.S. 1940 total population as the standard. Do not compare these rates to rates not comparably adjusted.

The State Center's Leading Causes of Mortality (32) provides the most concise measure available to study the forces of mortality among health service areas, regions of the Department of Human Resources and counties. The table on the next page summarizes those age-race-sex-adjusted death rates by cause and health service area.

An immediate observation is the large number of above-average rates found in the Cardinal and Eastern HSAs with a particularly notable excess in the case of atherosclerosis in the Cardinal. Other excesses most worthy of note would include lung, cervical, and ovarian cancer as well as pneumonia/influenza in the Eastern HSA; accidents, especially motor vehicle, in the Cardinal; chronic obstructive lung disease in the Capital; homicide, nephritis/nephrosis, and chronic liver disease/cirrhosis in the Southern Piedmont; and ovarian cancer in the Western HSA. No rate in the Piedmont HSA exceeded the state average by as much as 10 percent.

The extent to which diagnostic and certification practices account for the HSA differences is unknown. To further detail mortality excesses, the race-sex excesses in age-adjusted mortality of a geographical unit may also be examined. In the cases of excessive atherosclerosis in the Cardinal HSA and cervical cancer in the Eastern, for example, comparisons to the N.C. rates are given below. These data reveal that the atherosclerosis excess involved all Cardinal race-sex groups except white males and that the Eastern cervical cancer excess involved nonwhite females more than their white counterparts.



Age-race-sex-adjusted Death Rates\* by Cause and Health Service Area  
North Carolina 1979-81

Underlying Cause of Death	North Carolina	Western	Piedmont	Southern Piedmont	Capital	Cardinal	Eastern
All Causes	816.4	777.8	797.9	820.5	825.3	853.9	867.0
Diseases of Heart	301.0	286.9	291.3	301.9	311.9	320.6	321.7
Cerebrovascular Disease	80.2	68.0	79.9	80.7	74.7	88.6	89.5
Atherosclerosis	9.8	8.2	9.2	9.7	8.0	15.4	10.0
Cancer	162.4	153.1	162.8	162.7	168.5	163.0	170.7
Stomach	4.8	4.8	4.4	5.3	5.0	4.4	4.7
Colon/Rectum/Anus	17.7	16.1	17.6	19.1	17.3	17.1	18.5
Pancreas	8.9	8.2	9.7	8.7	8.5	9.9	8.3
Trachea, Bronchus/Lung	40.5	36.4	40.2	37.9	44.3	42.3	47.7
Female Breast	25.6	24.4	25.9	24.5	27.8	23.5	27.2
Cervix Uteri	4.9	5.0	4.9	4.2	4.2	4.3	6.2
Ovary/Uterine Adnexa	7.6	8.6	7.5	8.0	6.9	6.5	8.7
Prostate	21.6	20.6	21.9	22.6	21.2	22.3	21.0
Leukemia	6.6	7.4	7.1	6.0	6.5	5.7	6.7
Diabetes Mellitus	13.9	13.9	13.7	13.9	13.9	14.0	15.0
Pneumonia/Influenza	21.1	21.9	18.7	22.1	21.7	19.2	24.3
Chronic Obstructive Lung Disease	20.4	19.7	21.2	18.8	22.8	21.2	22.0
Chronic Liver Disease/Cirrhosis	11.8	13.0	11.4	13.5	11.2	12.3	11.8
Nephritis/Nephrosis	8.1	6.6	7.6	9.2	8.8	8.1	8.3
Motor Vehicle Accidents	26.2	26.2	26.3	24.2	24.2	29.6	26.3
Other Accidents/Adverse Effects	25.9	28.4	21.6	24.1	24.8	28.7	27.0
Suicide	12.0	11.5	13.0	12.0	12.3	11.8	11.8
Homicide/Legal Intervention	11.1	12.4	10.3	13.5	12.3	11.8	11.8

\*Deaths per 100,000 population, computed by the direct method using 10-year age groups and the North Carolina population as the standard. Do not compare these rates to any other adjusted rates here or elsewhere published.

Selected Race-sex-specific Age-adjusted Death Rates\* 1981

	<u>Total</u>	<u>White Male</u>	<u>White Female</u>	<u>Nonwhite Male</u>	<u>Nonwhite Female</u>
<u>Atherosclerosis</u>					
North Carolina	5.0	5.6	3.9	6.8	6.4
Cardinal HSA	7.6	5.0	6.7	13.4	9.5
Cardinal Excess	52%	-11%	72%	97%	48%
<u>Cervical Cancer</u>					
North Carolina	4.2	-	2.9	-	9.3
Eastern HSA	6.4	-	3.5	-	12.6
Eastern Excess	52%	-	21%	-	35%

\*Deaths per 100,000 population, computed by the direct method using 10-year age groups and the U.S. 1940 total population as the standard. Do not compare these rates to rates not comparably adjusted.

For HSAs, age-adjusted rates for race-sex groups by cause are available from the State Center while a county will find those rates for the 1979-81 period in its Health Data Book (38). Further detailing of mortality excesses is also possible through the examination of cause-race-sex-specific rates that are also specific (rather than adjusted) for age, but small numbers of deaths may come into play here and the resulting rates may therefore be unreliable.

For additional information concerning cause-specific mortality, the reader is referred to the publication Leading Causes of Mortality for 1981 (32). In addition to statistical tables, maps and graphs, that volume includes cause-specific discussions of trends, patterns, risk factors, survival rates, and recent research. Of particular interest are findings of statistically significant geographic clusters of high county rates for certain forms of cancer and major cardiovascular diseases.

Finally in the area of mortality statistics are deaths that have been characterized as sentinel health events (24). Based on the collective thoughts of a number of North Carolina health officials, deaths tabulated in the next table represent the minimum set about which the health community at large and public health in particular should ask, "Why did they happen?" Certainly, the reduction and eventual elimination of deaths from these causes are the most basic of health goals for North Carolina. (Note: See section on Morbidity concerning communicable disease cases considered to be sentinel health events.)



Sentinel Event Deaths  
North Carolina 1981

<u>Cause of Death (Codes)</u>	<u>Ages</u>	<u>Number of deaths</u>
Salmonella infections (003)	All	2
Tuberculosis (010-108, 137)	All	75
Tetanus (037)	All	1
Rocky Mountain Spotted Fever (082.0)	All	5
Congenital syphilis (090)	All	1
Death from weather exposure (900.0. 901.0)	All	7
Maternal Deaths (630-676)	All	7
Death of infant weighing over 2500 grams at birth with no congenital anomaly	Under 1	276
Motor vehicle accidents (810-825)	Under 2	11
Accidental poisoning (850-869)	Under 5	1
Accidental drowning and submersion (910)	Under 10	19
Accidental or unspecified gunshot (922,985)	Under 10	2
Suicide	Under 18	28
Influenza and pneumonia (480-487)	1-44	69
Acute myocardial infarction (410)	Under 45	216
Cerebrovascular disease (430-438)	Under 45	137
Nephritis, nephrotic syndrome, nephrosis (580-589)	Under 45	34
Malignant neoplasms of cervix uteri (180)	Under 55	58
Malignant neoplasms of other female genital organs (184)	Under 55	2
Inflammatory disease of female pelvic organ (614-616)	Under 55	1

Note: Other causes examined for which there were no deaths in 1981 were: typhoid fever, shigellosis, food poisoning, diphtheria, whooping cough, polio, rubeola, congenital rubella, RH incompatibility.

## Morbidity Statistics

Although underreporting of certain diseases is known to exist, a system for the reporting of specified communicable diseases has been in place in North Carolina since 1918. Based on those reports, data for recent years are given on the next page. Shown there are numbers of cases rather than population-based rates.

Hepatitis A activity peaked in 1972 as it had at earlier 6-to-10 year intervals, suggesting a cycle based on depletion of susceptibles in the population at regular intervals. Hepatitis B continued a general increase in incidence during the 1970s, possibly at least partially as a reflection of the increasing availability of diagnostic tests for this viral infection.

Measles activity dropped to a low ebb in the middle of the decade following enactment of a rubeola immunization law by the 1971 General Assembly. A resurgence took place in the late '70s, but its occurrence was held to the lowest level ever in 1981 following a rewrite of the state immunization law in 1979.

Although mumps immunization is not required by North Carolina law, there was a decline in mumps morbidity paralleling that of rubella--another vaccine-preventable disease--following the 1979 immunization law rewrite. Mumps immunization of children is provided through the North Carolina Immunization Program.

Rocky Mountain spotted fever morbidity peaked at 321 reported cases in 1980--the worst year yet recorded for this tick-borne rickettsial disease. Any other satisfactory control program notwithstanding, hope persists for an effective vaccine to prevent this potentially fatal disease. In the meantime, North Carolina leads the nation in this type of morbidity. The state also had one of the nation's highest tuberculosis case rates in 1980, but the number of cases declined in 1981. (39)

The enteric infections, salmonellosis and shigellosis, waxed and waned independently during the 1970s with salmonellosis morbidity beginning a rise in 1974 which has not yet peaked. Recent increases in gonorrhea and syphilis also continued into 1981.

The health community should also be aware of increases in penicillinase-producing *Neisseria gonorrhoeae* (PPNG), a strain of gonorrhea that is resistant to penicillin. In North Carolina, reported cases totaled 44 during 1981 versus 70 during 1982. The 1982 county frequencies for the disease are given in the Health Data Book (38). Fortunately, only 16 cases of the disease were reported during the first 9 months of 1983. (40)

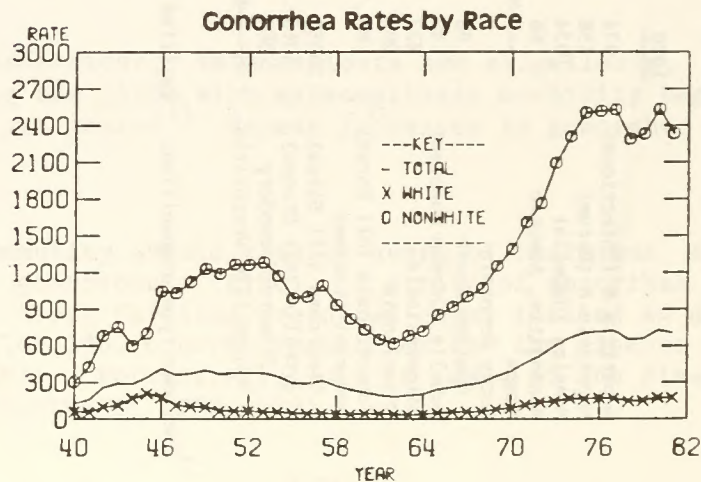
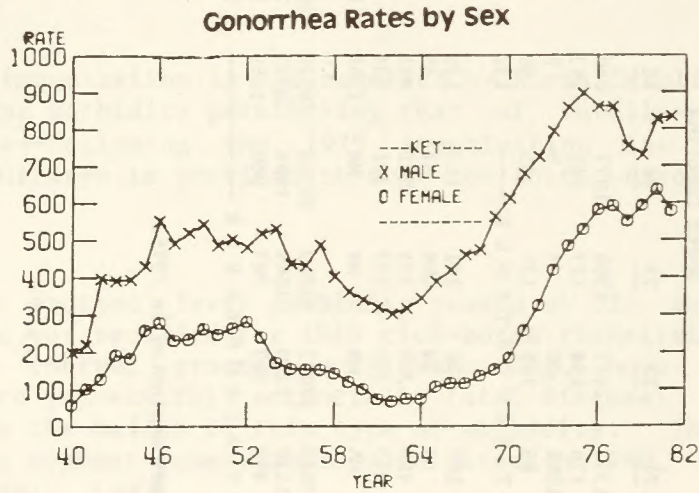
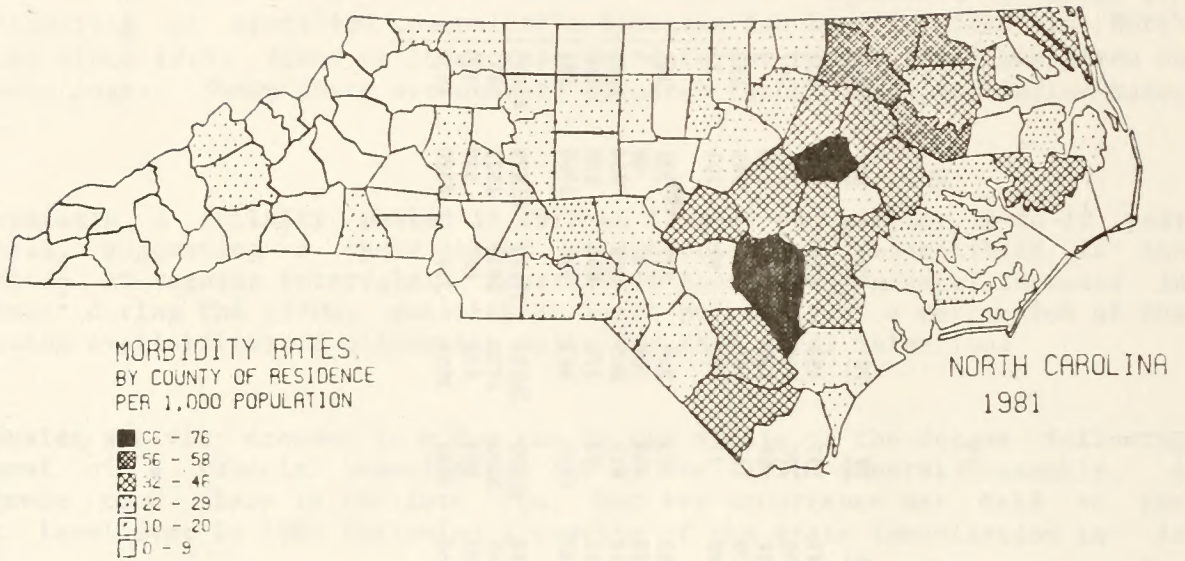


Selected Communicable Disease Cases  
North Carolina

	1970	71	72	73	74	75	76	77	78	79	80	81
Hepatitis A (Infectious) <sup>1</sup>	974	1332	1617	1304	1077	840	647	597	459	620	568	423
Hepatitis B (Serum)	158	178	194	127	142	263	270	276	230	398	376	347
Measles (Rubeola)	1034	1966	38	4	5	6	24	66	125	115	130	3
Meningitis, Aseptic	68	85	146	131	45	59	79	144	195	241	349	159
Mumps	-----	O T R E P O R T A B L E	-----	-----	-----	132	389	77	82	91	101	23
Rocky Mountain Spotted Fever	88	107	121	141	113	129	192	223	204	247	321	301
Rubella (German Measles)	49	53	34	204	57	45	18	454	204	537	48	5
Salmonellosis	427	460	384	331	361	471	514	812	865	803	884	1002
Shigellosis	204	233	310	337	321	134	82	82	171	690	128	148
Tuberculosis (All Forms) <sup>2</sup>	NA	NA	NA	NA	NA	1164	1220	1042	943	990	1066	981
Venereal Diseases												
Gonorrhea (All Sites)	20051	23846	27073	31863	35764	38526	39484	40409	36834	37412	41679	41825
Syphilis (All Stages)	1363	1170	1270	1669	1984	2321	2762	2232	1720	1433	1521	1837
Primary/Secondary	504	479	597	743	968	1169	1292	821	634	461	529	700
Nonspecific Urethritis	-----	O T R E P O R T A B L E	-----	-----	-----	-----	1550	3141	3604	3380	4320	4636

<sup>1</sup>Includes type unspecified. <sup>2</sup>Verified cases beginning in 1975.

# TUBERCULOSIS





A second strain of gonococcus that is resistant to penicillin at a high level but that is non-PPNG has been reported in Durham County since mid-February. While cases of this disease have been reported in several places in the world, this is the first reported U.S. outbreak. As of October 15, 1983 Durham County had reported 190 confirmed cases, Guilford County had reported 5, and Wake County had reported 1. (40)

Although there seems to be considerable public concern about genital herpes simplex, no reliable surveillance data exist for this disease. The number of clinical specimens received by the Division of Health Services Laboratory Section for herpes culture has increased dramatically during the past several years, but it is difficult to know how much of this increase is due simply to a heightened awareness of this condition.

Acquired immune deficiency syndrome (AIDS) is a "new" disease, first recognized within the past five years. Nationally, over 1,000 cases have now been reported, and the "4H" high-risk groups for acquiring this serious disorder - - male homosexuals, heroin addicts, Haitians, and hemophiliacs - -account for about 95% of all recognized cases. As of October 15, 1983, seven North Carolina cases had been reported. (41)

Several North Carolina health officials have recently compiled a list of communicable diseases that may be characterized as sentinel health events (24). By definition, these are cases of disease about which the health community should ask and investigate, "Why did they happen?" The following list represents the minimum set of such cases. (Note: See Section on Mortality concerning sentinel event deaths.)

Reported Sentinel Event Cases  
North Carolina 1981

<u>Disease (Report Card Codes)</u>	<u>Number of Reported Cases</u>
-Typhoid Fever (46)	5
-Salmonella infections (28)	1002
-Shigellois (29)	148
-Other bacterial food poisoning (10-13)	306
-Tuberculosis (601-609, 701-709, 801-809, 901-909)	981
-Whooping Cough (49)	12
-Tetanus (42)	2
-Rubeola (19)	3
-Congenital rubella*	0
-Diphtheria (7)	0
-Polio (22, 23)	0
-Congenital Syphilis (284)	8

\*ICD 771.0 from birth certificate.

In recent years, occupational morbidity has come to the fore as a major concern of the health community. In North Carolina, that concern involves the following:

- Among states, N.C. is unsurpassed in the percentage of nonagricultural workers employed in manufacturing. In 1980, this amounted to 854,549 workers or about one-third of the entire civilian labor force (11).
- N.C. is a leading producer of textiles and furniture, industries in which health hazards abound. These hazards include pneumoconiosis-producing dusts, high noise levels, organic solvents, carcinogens, and teratogens. (42)
- N.C. has a high concentration of small industries which have few resources for health education and promotion (42) and which are often small enough to be exempt from vigorous safety regulations (3).
- According to Public Health Service estimates, between 8,000 and 20,000 new cases of occupational illness occurred in North Carolina during 1978; only 3,248 were reported (42).

Data given in the next table concern Surgeon General goals for work-related accidents (15). At rates of improvement comparable to those projected nationally, North Carolina might expect the following:

Work-related Accident Statistics  
(Private Sector Only)

	<u>N.C. 1981 (43)</u>	<u>N.C. 1990 Projected</u>	<u>U.S. 1990 Goal</u>
-Work-related disabling injury cases per 100 full-time workers	7.0 <sup>1</sup>	6.4 <sup>1</sup>	8.3
-Lost workdays due to injuries per 100 workers	37.2 <sup>2</sup>	32.2 <sup>2</sup>	55.0

<sup>1</sup>Includes all injuries, not just "disabling." <sup>2</sup>Includes restricted activity days.

During 1982, a total of 51,962 cases administered under the N.C. Workmen's Compensation Act involved about 1.68 million lost workdays and included the following outcomes (44) which nationwide goals purport to reduce:



-Deaths	91
-Compensable occupational dermatitis cases	333
-Occupational heavy-metal poisoning cases	1

(Note: U.S. goals for these measures were based on numbers that are unavailable for N.C.)

As the labor force shifts from blue-collar to white-collar occupations, there are also increased concerns about the occupational diseases of white-collar workers, in particular, diseases due to stress and sedentary activities.

Statewide, survey results indicate that, among the household population during any 30-day period, about one out of five N.C. adults experiences some health condition that results in restricted activity and that accidents are a main cause of such restriction (45). Thus, accident prevention in the community at large should represent a major public health focus.

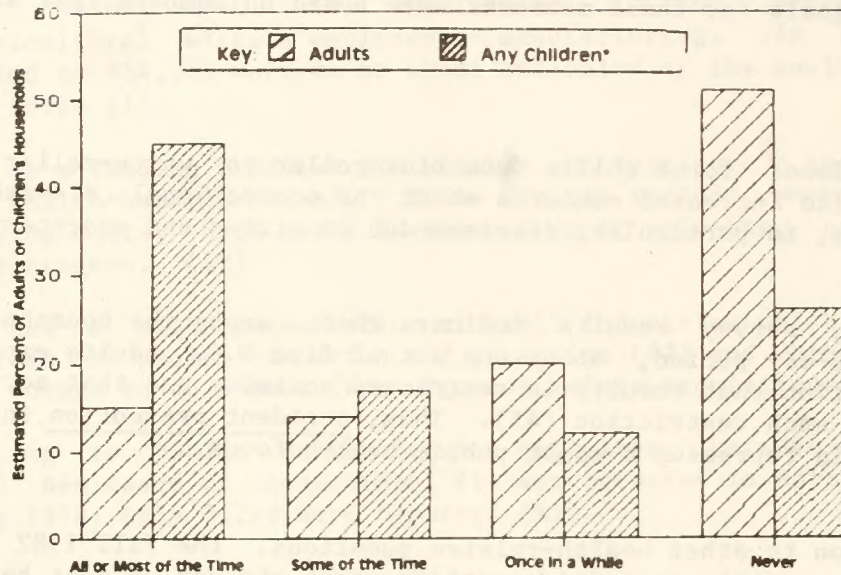
In addition to other health-related questions, the Fall 1982 North Carolina Citizen Survey (46) included questions about the use of seat belts and fire safety measures. Based on those results, half of adults and one-quarter of children never use a seat belt or car seat restraint; about 15% of adults and 45% of children use one all or most of the time. Frequency of use was positively related to respondent's education.

Among households, 57 percent reported the presence of a smoke detector in the home, and 41 percent reported a fire extinguisher in the home (or within 25 feet of the apartment). While 55 percent of householders claimed an escape plan in case of fire, only 32 percent of those with children reported actually practicing a plan. Whites and respondents at higher income and education levels were more apt to report fire safety measures. (46)

Concerning fires in the home, about 5 percent of households reported having had one or more within the past two years; the main causes were cooking-related (27%), electrical (18%), woodstove (17%), fireplace-related (11%) and misuse of matches or smoking (11%). More than half called the local fire department and 12 percent reported injuries to one or more household members. Low-income and larger households reported fires more than others. (46)

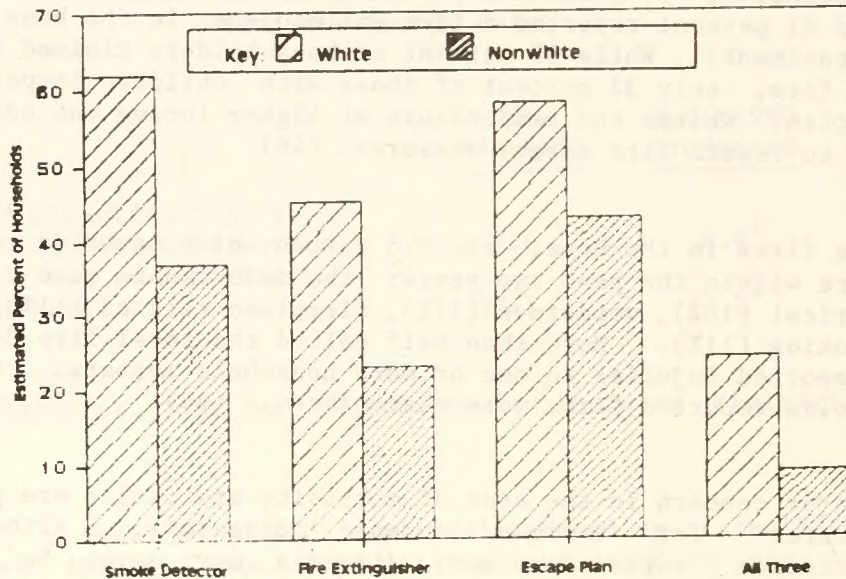
Also of major concern in the area of morbidity statistics are prevalence or incidence rates for various chronic diseases. Although "true" prevalence/incidence rates for many diseases may never be known, two computerized data systems do provide some measures that allow for comparisons over space and/or time. Those are (a) hospital discharge files and (b) diagnosed disease data collected periodically in the North Carolina Citizen Survey.

### Use of Seat Belts North Carolina Citizen Survey 1982



\*Percentage of children's households reporting use by any children.

### Use of Fire Safety Measures North Carolina Citizen Survey 1982





While hospital discharge rates may not be used to estimate generalized morbidity, they do capture a central component of the morbidity picture and serve some useful purposes, such as measuring the demand for various hospital services as a basis for hospital personnel and facility planning.

For residents of North Carolina and the United States during 1980, rates of discharge from nonfederal short-stay hospitals were as follows:

1980 Hospital Discharges per 1,000 Population  
(excludes normal newborns)

<u>Resident Data</u>	<u>North Carolina (47)</u>	<u>United States (48)</u>
All Patients	147.6	167.0
Age of Patient		
Under 15	61.2	71.6
15-44	128.7	148.6
45-64	186.7	194.6
65 and over	351.1	386.2
Sex of Patient		
Male	119.9	137.6
Female	173.7	194.8
Race of Patient		
White	153.9	171.5
Nonwhite	127.9	145.0
Principal Diagnosis		
Heart Disease	11.4	14.1
Cancer	7.0	8.1
Diseases of Respiratory System	12.3	15.2
Disease of Digestive System	19.1	20.5
Diseases of Genitourinary System	16.0	15.9
Diseases of Musculoskeletal System	8.0	9.9
Diseases of Nervous System	6.6	7.8
Pregnancy and Childbirth	17.2	21.1
Symptoms and Ill-defined Conditions	8.4	2.8
Accidents, Poisonings and Violence	12.1	15.9
Mental Disorders	5.3	7.5

In general, the N.C. discharge rates are consistently lower than those for the U.S. While this could reflect lower morbidity in N.C., a large part of this difference is probably due to less access to hospital care in N.C. and to differences in physician practices with regard to hospital admission.

While the U.S. discharge rates are derived from a representative sample of hospitals, the N.C. rates are based on a census of hospitals, with adjustments for nonreporting. Since such adjustments to produce county-of-residence rates do not appear feasible, counties must rely on Medicaid and Medicare discharge rates which do represent 100-percent reporting for those patients. These 1980 county rates are in the Health Data Book (38) and an earlier report in the SCHS Studies series (47).

The N.C. resident hospital discharge rates given below represent 1980 discharges (except normal newborns) per 1,000 Medicaid eligibles or Medicare enrollees. The rates for these two subpopulations may be compared to some in the preceding table for all N.C. residents; they are also a point of comparison for county rates. Altogether, about 56,000 Medicaid discharges among 457,246 Medicaid eligibles and 245,300 Medicare discharges among 667,843 Medicare enrollees are represented. (47)

Medicaid Discharges per 1,000 Eligibles: All conditions (123.6), cardiovascular disease (4.0), cancer (5.0), chronic lung disease, (4.0), diabetes (2.6), accidents/poisoning/violence (8.2), obstetric/perinatal complications (11.0).

Medicare Discharges per 1,000 Enrollees: All conditions (367.3), acute myocardial infarction (10.4), other ischemic heart disease (17.9), stroke (20.3), cancer (30.6), lung cancer (4.3), colon cancer (3.4), prostate cancer (3.9), chronic lung disease (13.4), diabetes (7.6), arthritis (6.7), accidents/poisoning/violence (24.8), kidney disease (7.8).

Unfortunately, trend data for the Medicaid/Medicare discharge rates are not available. The preceding rates do, however, provide baseline data for future studies as well as a comparison for the 1980 county rates (38,47).

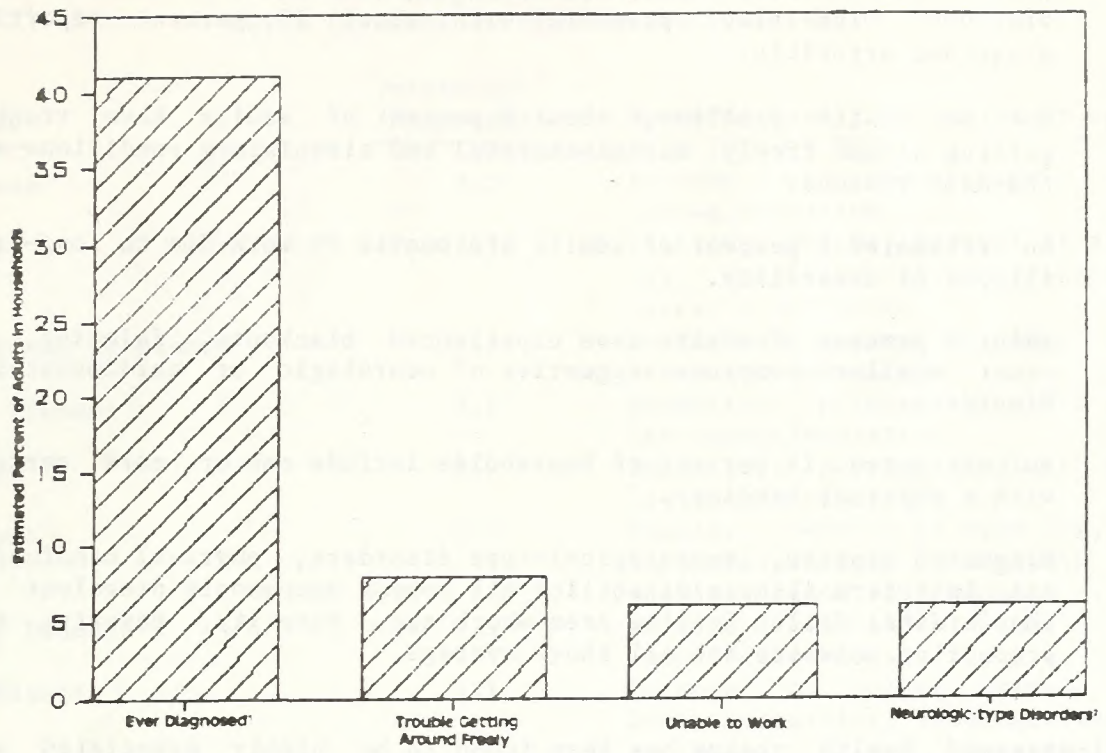
The North Carolina Citizen Survey (NCCS), conducted at least annually since 1976 by the Office of State Budget and Management, collects information on chronic health problems in the adult household population. To date, the State Center has produced four reports (45,49-51) detailing those results for the state and its six health service areas.

Due to a change in weighting procedures in 1980, estimates from prior NCCSs are not strictly comparable to 1980-82 estimates. Nevertheless, the following indicators of chronic health problems in the adult household population appear relatively stable (45,46,49-51):

- Excluding arthritis, about one-third of adults have been told by a doctor that they had one or more of the leading chronic diseases - women and nonwhites more often than men and whites. Including arthritis, about four out of ten adults reported diagnosed chronic disease in 1982. (See chart of diseases on next page.)

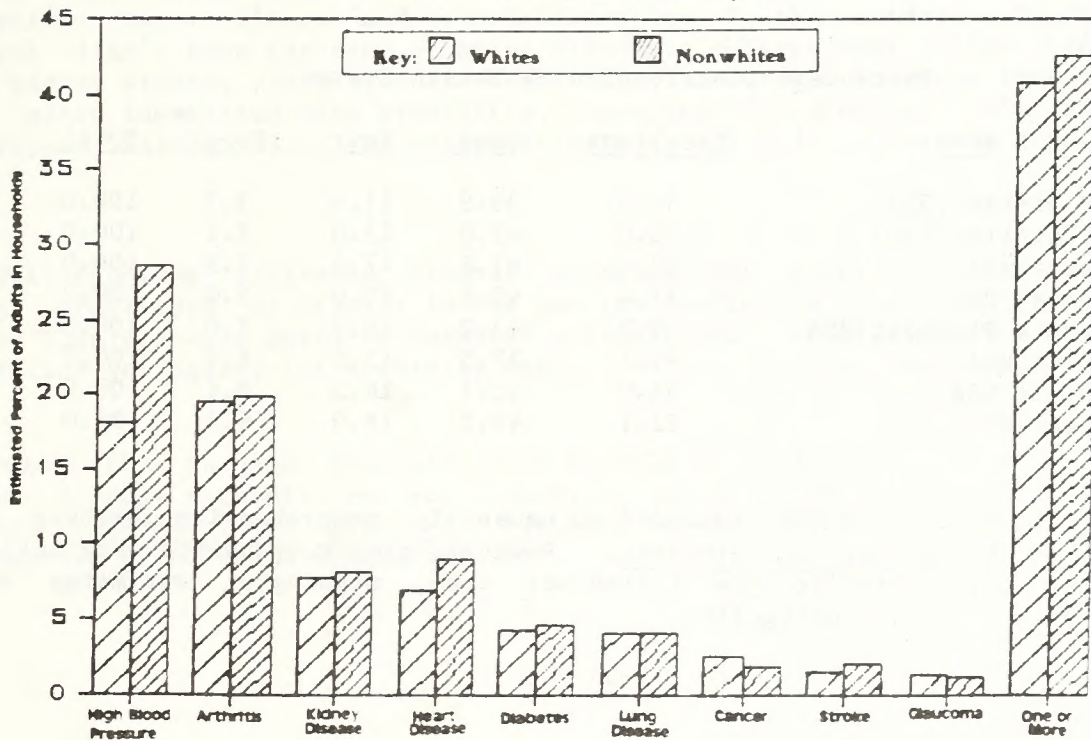


# Adults Having Health Problems North Carolina Citizen Survey 1976-1982



\*One or more of nine conditions: see next chart. †Fainting, blackouts, etc.

## Adults Ever Diagnosed North Carolina Citizen Survey 1982



- On the whole, high blood pressure and arthritis are by far the most prevalent of the chronic diseases; about 21 percent of adults report diagnosed high blood pressure with about 19 percent reporting diagnosed arthritis.
- Due to health problems, about 8 percent of adults have trouble getting around freely; musculoskeletal and circulatory conditions are the main reasons.
- An estimated 6 percent of adults are unable to work due to long-term illness or disability.
- About 6 percent of adults have experienced blackouts, fainting, or other similar symptoms suggestive of neurologic or cardiovascular disorders.
- An estimated 14 percent of households include one or more persons with a physical handicap.
- Diagnosed disease, neurological-type disorders, physical handicaps, and long-term illness/disability all appear uncommonly prevalent in the Cardinal Health Service Area where age, rurality, poverty, and proportion nonwhite are all above average.

Self-assessed health status has been found to be highly associated with actual health status and with utilization of health services (52). Data from the 1978 National Health Interview Survey (persons 17 and older) and from the 1981 North Carolina Citizen Survey (persons 18 and older) reveal the following levels of respondent-assessed health when respondents were asked to relate to other persons of the same age (51,52):

#### Percentage Distribution by Health Status

<u>Area</u>	<u>Excellent</u>	<u>Good</u>	<u>Fair</u>	<u>Poor</u>	<u>Total</u>
United States (52)	44.3	39.9	11.6	3.7	100.0
North Carolina (51)	36.0	42.0	15.0	7.1	100.0
Western HSA	33.4	41.6	17.5	7.5	100.0
Piedmont HSA	37.4	42.6	15.0	5.0	100.0
Southern Piedmont HSA	39.3	43.2	10.5	7.0	100.0
Capital HSA	41.1	37.5	12.5	8.9	100.0
Cardinal HSA	33.0	42.1	16.3	8.6	100.0
Eastern HSA	32.1	43.5	18.0	6.5	100.0

The Fall 1982 NCCS (46) included an unusually comprehensive battery of questions concerning diagnosed diseases. However, many respondents were unable to identify their specific type of disease; thus, meaningful estimates are available only for broad categories.



Adults Reporting  
Diagnosed Disease  
North Carolina Citizen Survey 1982 (46)

<u>Disease</u>	<u>Percentage Diagnosed</u>	<u>Most Frequently Diagnosed Groups</u>
Diabetes	4.5	Persons of older age, low income/education.
Cancer	2.3	Females; whites; persons of older age, very low income/education, easterly residence.
High Blood Pressure	20.5	Nonwhites; persons of older age, low income/education.
Heart Disease <sup>1</sup>	7.4	Nonwhites; persons of older age, low income/education.
Stroke	1.7	Nonwhites; persons of older age, low income/education.
Glaucoma	1.3	Females; persons of ages 65+, low income/education, mountain or coastal region residence.
Kidney Disease <sup>2</sup>	7.9	Persons of older age, low income/education.
Lung Disease <sup>3</sup>	4.1	Persons of older age, low income/education, mountain region residence.
Arthritis <sup>4</sup>	19.4	Persons of older age, low income/education, mountain region residence.

<sup>1</sup>Types most often identified were angina pectoris, myocardial infarction, congenital heart disease and arteriosclerosis, in that order. Thirty-eight percent didn't know the type of heart disease. <sup>2</sup>Types most often identified were kidney stones, infection and nephritis; 18% didn't know the type. <sup>3</sup>Types most often identified were bronchitis, emphysema and pleurisy; 9% didn't know the type. <sup>4</sup>Mainly, adult rheumatoid arthritis; 41% didn't know the type.

Self-reported diagnosed disease rates may not accurately represent the actual prevalence of illness in the general population, but they are a step closer than measures based on hospital utilization. It also appears that they are better surrogates for morbidity than are all-conditions death rates (53).

Among the Surgeon General's health goals for 1990 (15), none addresses chronic disease morbidity per se. However, several health promotion goals do address health-related lifestyle factors, specifically, cigarette smoking, consumption of alcohol, and exercise.

At rates of change comparable to those expected nationwide, North Carolina's recent lifestyle indicators together with projected 1990 indicators and the U.S. 1990 goals appear as follows:

#### Lifestyle Indicators

	N.C. Recent Year	N.C. 1990 Projected	U.S. 1990 Goal
-Percent of adults who smoke	37 <sup>1</sup>	<28	<25
-Per capita per year consumption of legal absolute alcohol (gallons)	2.18 <sup>2</sup>	2.18 <sup>2</sup>	2.82 <sup>3</sup>
-Percent of adults participating in regular exercise	44 <sup>4</sup>	>51	>60 <sup>5</sup>

<sup>1</sup>North Carolina Citizen Survey 1980, persons 18 and older (54). <sup>2</sup>From State Alcoholism Profile Information System National Status Report 1978, gallons per person 18 and older (55). <sup>3</sup>Gallons per person 14 and older; the U.S. goal is to maintain or reduce the current level (15). <sup>4</sup>North Carolina Citizen Survey 1979, percent of persons 18+ reporting planned exercise several times a week (50). <sup>5</sup>U.S. goal for persons 18-64, based on survey of persons 20-64 (15).

The Surgeon General's health goals for 1990 also include a number of objectives regarding the nutritional status of the U.S. population, for example, objectives related to iron-deficiency anemia in pregnancy, the breastfeeding of newborns, obesity, serum cholesterol levels, sodium ingestion, and general public awareness of good dietary practices. Since baseline data for those objectives are largely unavailable, the specific U.S. goals are not addressed here. However, users of this report should be aware of certain data available from a statewide household nutrition survey conducted in 1970 (56,57). That survey revealed widespread dietary deficiency in North Carolina, particularly in the East, among nonwhites, and at low levels of household income. In addition, the Fall 1979 North Carolina Citizen Survey (50) solicited information on changes in the dietary practices of the adult household population. To what extent those results reflect actual change as opposed to knowledge of desirable change is unknown, but between one-fifth and one-third of respondents did report reduced consumption of fried foods, eggs, butter, soft drinks, salt, and beef/pork and increased consumption of vegetables, fruit, fish/chicken/turkey, and whole-grain bread. In general, females and residents of the Capital HSA were most apt to report these changes.

The Surgeon General's health goals for 1990 likewise address environmental health hazards (15). As above, baseline data for those objectives are largely unavailable, but the following statistical indicators (58) point up the potential for serious problems to accrue:



- Among states, North Carolina ranks eleventh in generating hazardous waste and fourth in low-level radioactive waste. During 1982, 618 N.C. firms generated 6.2 billion pounds of hazardous waste.
- Ninety-eight percent of the hazardous waste handled by N.C. facilities in 1982 was handled at the site of generation. Ninety-five percent of it was treated by on-site facilities. This includes not only waste generated by N.C. facilities but the 16 million pounds shipped to North Carolina from other states. Approximately 2% of the 1982 hazardous waste was shipped to off-site facilities - 0.6% to N.C. off-site treaters and 77 million pounds or 1.2% to out-of-state facilities. Most of the out-of-state shipments, 61%, went to South Carolina.
- At the end of 1982, 183 million pounds was in storage, 94% of which was in surface impoundments. Hazardous waste from generators of less than 2,200 pounds per month was not reported.
- During 1979, North Carolinians generated about 5.7 million tons of solid waste with the amount expected to increase by as much as 40 percent by the year 2000. The state's 170 approved sanitary disposal sites are filling up. Sixty-five percent of them will require replacement within a decade.
- Another major problem which requires close attention is maintaining high-quality shellfish sanitation, as it relates to both preventing pollution of N.C. shellfish growing waters and preventing shipment of unsatisfactory shellfish products into N.C. from other sources.
- Over 2,750 public community water systems now operate in the state, and the quantity of water used by them continues to increase. Development of adequate sources of water for these systems will become more of a problem as they grow. Continued development of small, independent, inadequately financed community water systems will remain a special concern.

The N.C. Commission for Health Services has recently adopted amendments to the state's hazardous waste management rules to provide more protection for ground and surface waters. Child screening for lead toxicity continues, and sources of exposure are tracked down in confirmed cases. The state's Radiation Protection Commission maintains regulations governing the use of radiation sources.

Finally in the area of morbidity statistics are those related to dental health problems. In 1976-77, a statewide survey (59) revealed widespread periodontal disease in North Carolina: 2 of 4 whites and 3 of 4 nonwhites over five years of age were found to be affected. That survey also revealed significant gains in the battle against dental caries. Still, nonwhites continued to have many decayed teeth, about 2 to 3 times more than their white counterparts. Related to this are findings of low levels of fluoride use in

some counties, based on data provided by the Dental Health Section of the Division of Health Services.

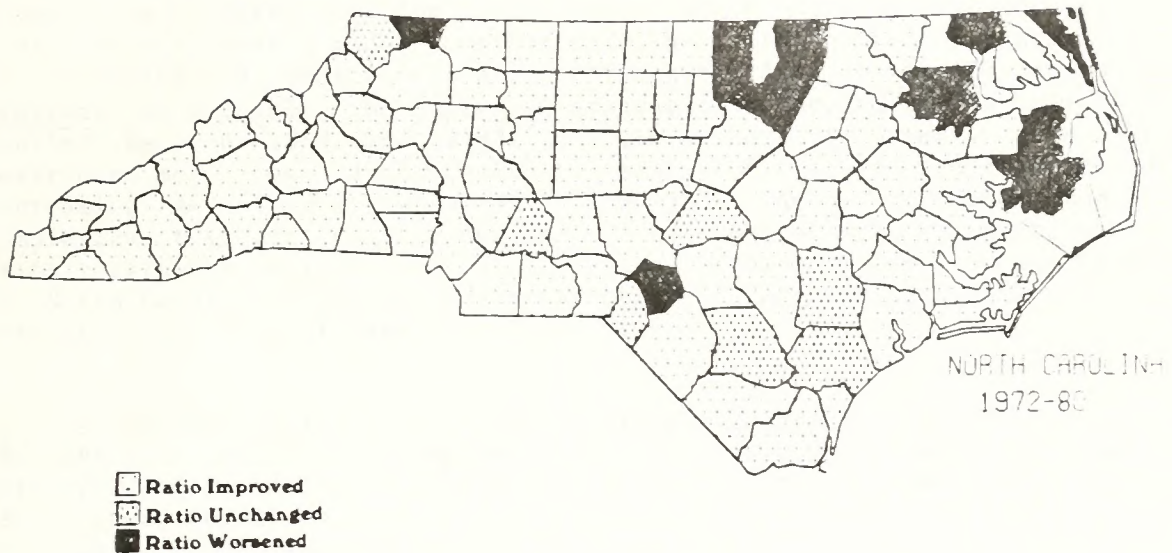
### Fluoride Use Statistics North Carolina 1983

-Estimated percent of population served by water supplies with natural or adjusted fluoride	48.0
-No. of counties with no fluoridated water	29
-Percent of school children K-8 on weekly fluoride mouthrinse program	48.0
-No. of counties with no fluoride mouthrinse program	21
-Percent of school children K-8 drinking fluoridated water through an adjusted school water fluoridation system	7.0

Compared to the 48.0 percent of the total N.C. population served by fluoridated water supplies, preliminary estimates for the U.S. and Public Health Service Region IV (8 states including N.C.) were 50.6 and 51.5 percent respectively, according to the Centers for Disease Control of the U.S. Public Health Service.



## Change in Population/Physician Ratio\*



\*Active nonfederal physicians. Source: North Carolina Area Health Education Centers Program.

## HEALTH CARE RESOURCES





## HEALTH CARE RESOURCES

One of the state's major recent initiatives has been in the area of medical education. In addition to creating the East Carolina University School of Medicine, which enrolled its first four-year class in 1977, the state has supported expansion of enrollment in all three existing medical schools -- Bowman Gray, Duke, and the University of North Carolina at Chapel Hill. The state has also made a major commitment to the training of family physicians and to decentralized medical education through the Area Health Education Centers Program. As a result, the number of graduates of North Carolina medical schools doubled between 1968 and 1982, and the number of primary care residency positions more than doubled with the subset of family practice residencies increasing sevenfold between 1973 and 1983. Among residents and fellows completing training in-state during 1977-82, 43% of all specialties, 47% of primary care specialties, and 62% of family practice residents chose to practice in North Carolina. Among the family practice residents who remained, 42% are practicing in towns of less than 5,000 population. (60)

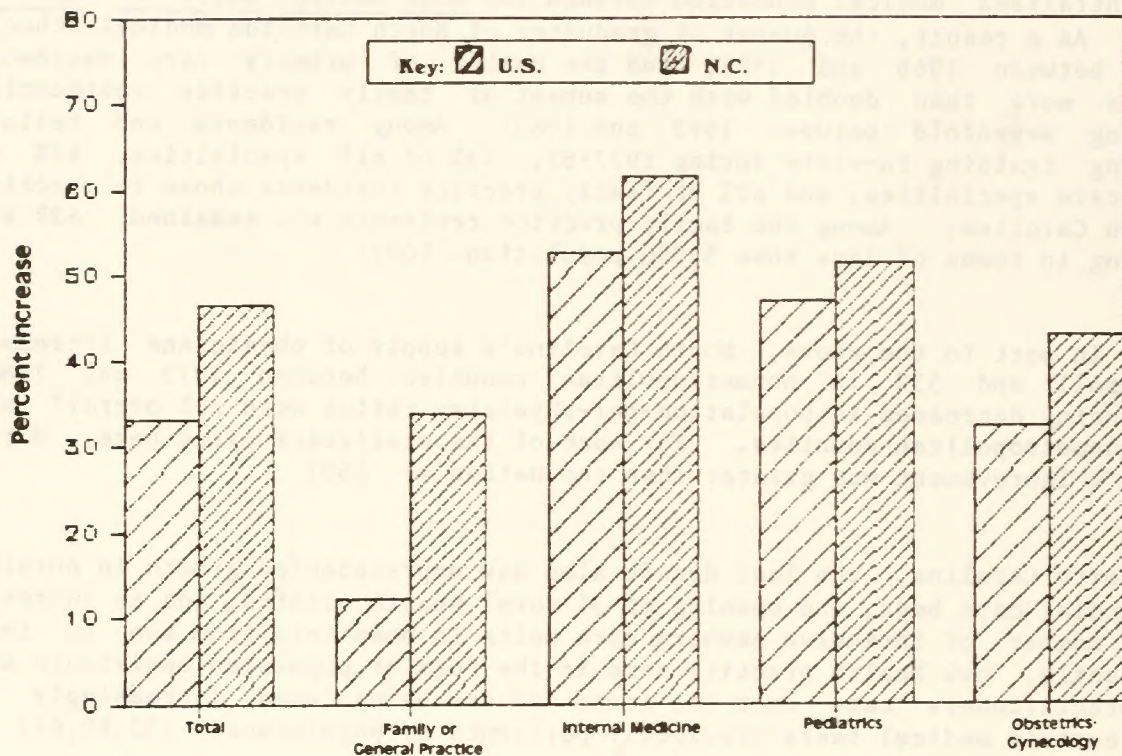
Due in part to the above, North Carolina's supply of physicians increased 48% overall and 53% in nonmetropolitan counties between 1973 and 1980. Corresponding decreases in population-per-physician ratios were 25% overall and 28% in nonmetropolitan counties. For each of the statistics cited here, North Carolina's improvement was greater than the nation's. (60)

In North Carolina, the last decade also saw unprecedented growth in nursing and custodial care beds, the opening of 31 rural health clinics, and an increase in the number of intensive newborn care units in hospitals from two to ten. Concomitantly, new health practitioners in the form of physician assistants and nurse practitioners came upon the scene and are being used increasingly to perform certain medical tasks previously performed by physicians. (32,60,61)

But despite these and other recent improvements, North Carolina still ranks behind most other states in the availability of health manpower and facilities. Exceptions include above-average levels of metropolitan-area physicians, certain physician specialties, hospital employees, and mental hospital beds. The next table illustrates.

Even if overall availability of resources were not a problem, accessibility often is, as indicated by the tabled data on primary-care-physician and dentist shortage areas in N.C. Also, 73 counties and 22 sub-counties had been designated "medically underserved areas" as of August 1979. In early 1983, the number of whole-county designations remained at 73. (62)

## Increase in Primary Care Physicians 1973-1980



SOURCE: North Carolina Area Health Education Centers Program



# HEALTH CARE RESOURCES STATISTICS (4,5)

<u>Health Manpower</u>	<u>United States</u>	<u>South Atlantic Area</u>	<u>North Carolina</u>	<u>Number of States Higher</u>
Civilians Per Nonfederal Physician 1980 <sup>1</sup>	556	563	657	23
Metropolitan Areas	469	458	428	38 <sup>2</sup>
Non-metropolitan Counties	1,117	1,022	1,176	22 <sup>2</sup>
Civilians Per Nonfederal Dentist 1980 <sup>3</sup>	1,845	2,145	2,611	4
Metropolitan Areas	1,656	1,842	2,045	8
Non-metropolitan Counties	2,674	3,165	3,367	7
Persons Per Active Optometrist 1980	9,901	12,658	14,706	9
Persons Per Active Pharmacist 1980	1,546	1,727	1,825	5
Persons Per Active Registered Nurse 1980	192	214	253	8
Civilians Per Active Nonfed. Physician 1978				
General and Family Practice	4,049	4,184	4,367	14
Internal Medicine and Related	2,950	3,096	3,731	24
Pediatrics	8,929	8,850	9,615	34
Surgical Specialties	2,915	2,857	3,367	20
Obstetrics and Gynecology	9,434	8,475	9,615	31
Psychiatry	8,130	8,772	10,989	26
Primary Care Physician Shortage Areas 1980	1,921	352	64	6
Physicians Need to:				
Remove All Shortage-area Designations	5,835	1,068	162	11
Achieve All Targets (2,000 persons per)	12,489	2,340	432	7
Dentist Shortage Areas 1980	916	237	44	4
Additional Dentists Needed to:				
Remove All Shortage-area Designations	2,442	596	115	5
Achieve All Targets (3,500 persons per)	3,067	844	161	3
<u>Community Hospitals</u>				
Persons Per Bed 1978	217	222	238	18
Percent of Beds Occupied 1978	73.2	73.0	75.7	12
Avg. Length of Stay in Days 1979	7.6	NA	7.4	24
Employees Per 100 Patients 1978 <sup>4</sup>	379	368	350	32
<u>Mental Hospitals 1978</u>				
Civilians Per Bed (Public)	1,171	NA	1,088	31
Civilians Per Bed (Public and Private)	754	NA	767	27

<sup>1</sup>Active, excluding doctors of osteopathy. <sup>2</sup>Excludes Alaska. <sup>3</sup>Active. <sup>4</sup>Full-time equivalent employees per 100 average daily patients.

County-level health care resources data comparable to the state data in the preceding table are not available from the same sources. Thus, for purposes of county-to-state comparisons and future trend studies, the following statewide statistics are offered. In the second item, physician-equivalent counts are based on the idea that one physician assistant or nurse practitioner roughly equates to 63 percent of a fulltime physician (32).

#### Health Care Resources North Carolina 1981 (32)

Persons per active primary care physicians	1,797
Persons per Primary Care Physician/Physician-equivalent	1,570
Persons per active registered nurse	193
Persons per active dentist	2,537
Persons per short-stay general hospital bed <sup>1</sup>	270
Persons 75+ per nursing care bed <sup>2</sup>	11

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<sup>1</sup>Nonfederal hospitals; active military population excluded. <sup>2</sup>Intermediate and skilled nursing care beds in nursing care units of general hospitals and nursing homes.

Except for dentists, the above resources and their geographical distributions are discussed and depicted in Leading Causes of Mortality 1981 (32).

In 1981, an estimated 5 percent of adults had problems getting medical care during the preceding 12 months; those problems appeared relatively more frequent in the Cardinal and Eastern HSAs. Among children's households, about 4 percent had trouble getting child medical care with problems more frequent in the Eastern and Western HSAs and among single-parent households. Cost was the chief problem cited. (51)

As the next table illustrates, hospital costs are rapidly rising but remain well below average in North Carolina. At the same time, private health insurance coverage for persons under age 65 appears near average despite high premium-to-benefit ratios, particularly among for-profit companies. The state's average coverage levels in 1980 also contrast with below-average levels reported in 1979 with the difference occurring largely among for-profit companies. At the same time, the following N.C. percentages for Medicare and Medicaid coverage are consistent with estimates for persons 18 and older obtained in the Fall 1981 North Carolina Citizen Survey. Thus, it appears safe to say that levels of government protection are lower in North Carolina than elsewhere although age distribution probably accounts for the Medicare difference. (12,51,63)



## Hospital Costs and Health Insurance Plans (12)

<u>Community Hospital Costs</u>	<u>United States</u>	<u>North Carolina</u>
Average cost to hospital per patient day 1980	\$246	\$187
Average cost to hospital per patient stay 1980	\$1,867	\$1,402
Average semi-private room charge 7/81	\$151.78	\$101.15
Percent increase since 1/81	5.8	5.0
 <u>Private Health Insurance 1980</u>		
Percent of population under 65 covered for		
Hospital Expense	84.9	86.6
Surgical Expense	81.5	80.8
Physician's Expense	77.5	75.6
Premium-to-benefit Ratios		
For-profit Companies	1.22	1.38
Nonprofit Plans	1.03	1.05
Percent of hospital insureds under 65 covered by for-profit companies	57.9	60.2
 <u>Medicare and Medicaid 1980</u>		
Percent population enrolled in Medicare	12.3	11.6
Benefit paid per enrollee	\$1,192	\$893
Percent population receiving Medicaid	8.9	6.4
Benefit paid per recipient	\$1,147	\$1,064

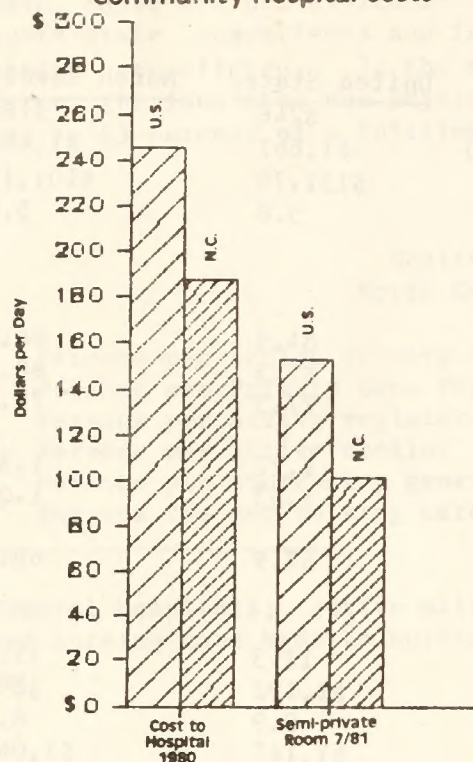
Various estimates of the U.S. uninsured population range from 6 percent to 12.6 percent of the total; the latest estimate was 5-8 percent in 1978. The Fall 1981 estimate for N.C. was 12 percent of persons 18 and older, ranging from under 7 percent in the Capital HSA to 17 percent in the Eastern. Statewide, the Fall 1982 estimate was about 11 percent of persons 18 and older. (12,46,51)

Other estimates from the Fall 1982 NCCS concern continuity of health insurance coverage. Statewide, 7 percent of persons 18 and older reported no coverage during the entire past year, 6 percent reported coverage during only part of the year. Premium costs and termination of employment were the main reasons cited. (46)

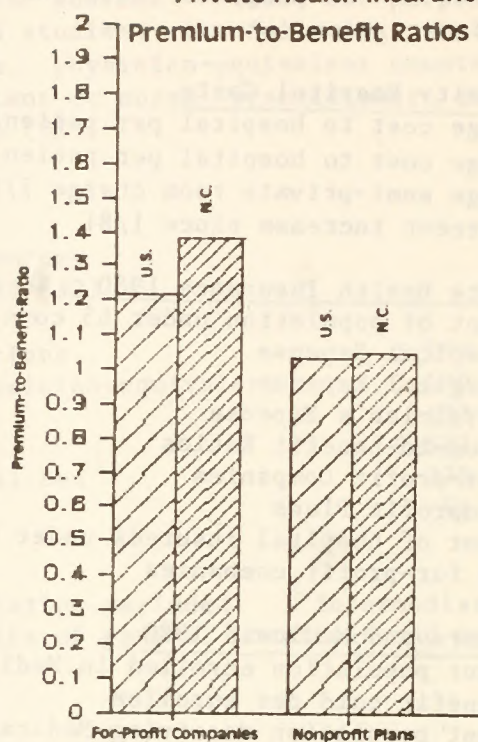
Regarding levels of health care demand, fewer North Carolinians than other Americans appear to use hospitals, physicians, and dentists. However, per-person-per-year physician visits were estimated at 5 each for both N.C. and the U.S. during 1974-76. In contrast, North Carolinians averaged only 1 dentist visit per year compared to 2 nationwide. (64)

The following statewide utilization statistics are also available on a county-of-residence basis (4):

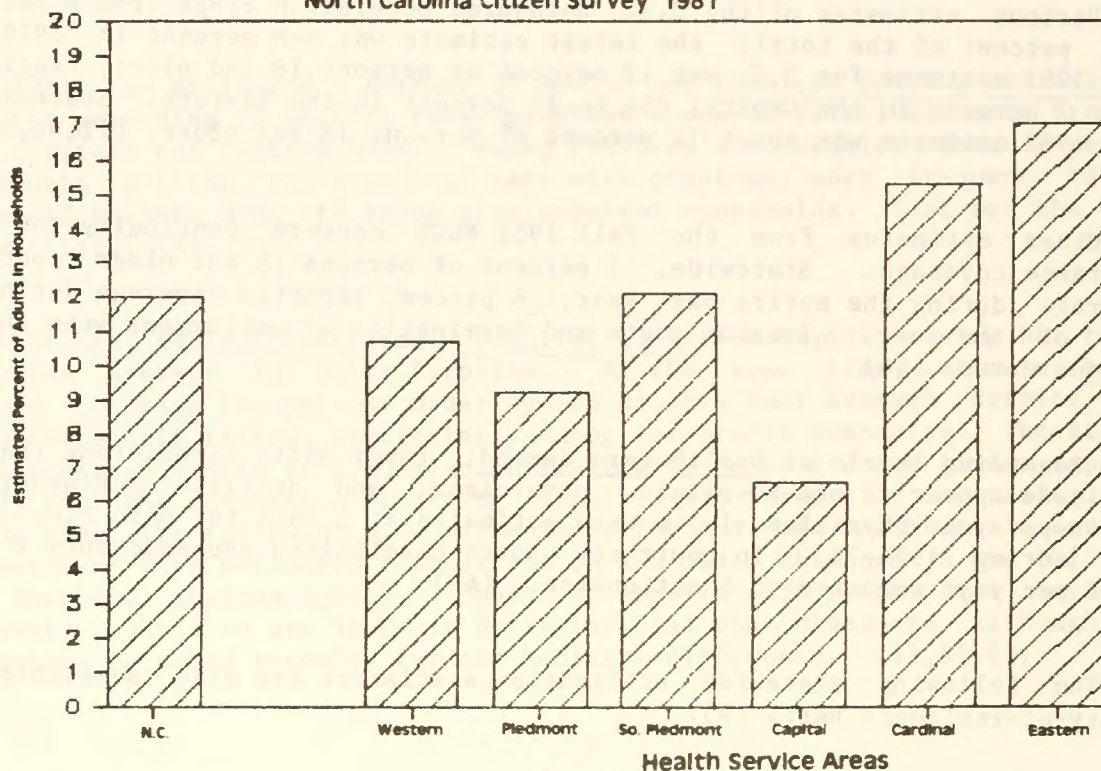
**Community Hospital Costs**



**Private Health Insurance  
Premium-to-Benefit Ratios 1980**



**Adults Having No Health Insurance\*  
North Carolina Citizen Survey 1981**



\*Neither private nor government insurance



Persons Served Per 1,000 Population<sup>1</sup>  
North Carolina 1980 (4)

State Mental Institutions <sup>2</sup>	4.6
Community Mental Health Clinics	25.9
Short-stay General Hospitals <sup>3</sup>	148
Nursing Homes <sup>4</sup>	61

<sup>1</sup>N.C. facilities only. <sup>2</sup>Mental retardation and alcoholic rehabilitation centers, psychiatric hospitals. <sup>3</sup>Nonfederal hospitals; active military population excluded. <sup>4</sup>Nursing care units of hospitals are not included.

In the past, North Carolinians have used public mental hospitals more often but for shorter periods than have other Americans (64). However, as observers of mental treatment practices will know, recent trends are toward more outpatient care and less institutionalization with the result that admissions/readmissions to the state's four hospitals for the mentally ill decreased during the past decade, by as much as 39 percent at Dorothea Dix between 1970 and 1981 (4).

The Hospice Movement has grown rapidly in North Carolina, this state being the first to have a state association to assist local developers. Since that group was formed in 1977, twenty-four local hospices have become operational and an additional 20 were in various phases of development in late 1982. (65)

North Carolina's Emergency Medical Services Program also grew rapidly during the last decade following the promulgation of regulations in November 1973. During the first three years of Emergency Medical Technician (EMT) training, over 14,000 persons were certified. By late 1982, initial certifications totaled more than 50,000 and an estimated 11,000 persons were practicing. (66)

Also during 1973, the Office of Rural Health Services was created in an effort to bring primary medical care to underserved areas of the state. Since that time, the Office has helped to recruit nearly 400 physicians to North Carolina and 31 rural clinics have opened with an additional two currently under construction. During FY 1982, those clinics accounted for nearly 157,000 patient visits. (61)

Interest in the development of alternative health care plans has grown in recent years such that, in 1982, the Governor established the North Carolina Foundation for Alternative Health Programs. This Foundation has as its mandate the encouragement of health care competition through the development of such cost-containment plans as Prepaid Group Practices (PPGPs) and Independent Practice Associations (IPAs), which are two types of Health Maintenance Organizations (HMOs). A dispersed population and lack of large urban areas in North Carolina have contributed to a slow rate of development; currently, only

two dental and two medical HMOs are located in the state. ComPrent, a privately-owned dental HMO, is located in Charlotte, and R.J. Reynolds Industries operates Winston-Salem Health Care and Winston-Salem Dental Care for the exclusive use of employees. The most recent HMO, the Blue Cross/Blue Shield Personal Care Plan, an IPA, was developed in 1981. This plan operates in the Research Triangle area with plans for expansion to include other areas of the state. It is anticipated that other alternative health care plans will be developed in the state over the next 5 years. (67)

Another recent trend involves the desire of pregnant women and their families for homestyle birthing. In response to this, most hospitals now have "birthing rooms" which are appointed in a homelike manner and in which the mother both labors and delivers. Outside the hospital, the concept of "birthing centers" envisions a free-standing facility for prenatal care and delivery. Such facilities are homelike and not subject to the restrictions imposed on obstetrical services in hospitals. Currently, there are two birthing centers in North Carolina, one situated in a hospital in Siler City and the other in a free-standing facility in High Point. Both are primarily staffed by certified nurse-midwives with supervision and medical back-up by physicians who are specialists in obstetrics. (68)

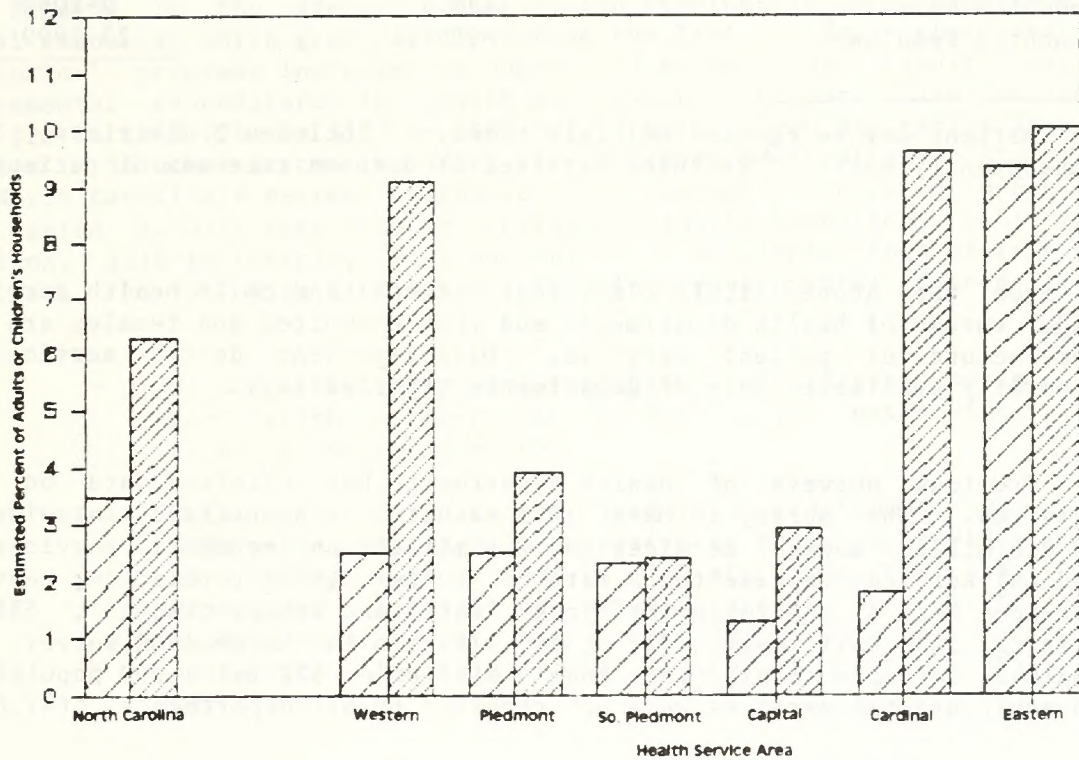
Although a majority of North Carolinians rely mainly on doctors in private practice for their medical care, hospital out-patient clinics, emergency rooms, and public health departments are also reported as "usual" sources of care. During the Fall of 1981, about 3.5 percent of adults considered a public health department their usual source; among households with children, about 6.3 percent considered a health department the children's usual source of care. Those users of health departments were most often nonwhite, of low to medium income, and from larger households. At levels of 9 to 10 percent, adults of the Eastern HSA and children's households in the Western, Cardinal, and Eastern HSAs used health departments far more than others. (51)

During 1976, an estimated 26 percent of households had used a health department within the past year; the percentage ranged from 25 to 27 among HSAs (49). Thus, the health department appears relatively more important as an occasional source of care than as a usual source of care.

A survey of third-party-reimbursable-type services delivered in local health departments during March 1981 provides data concerning each department's direct patient services. Department-specific data are found in the Health Data Book (38); the next table summarizes.



# Use of Public Health Departments\* North Carolina Citizen Survey 1981



Key: Adults Any Children+

\*As a usual source of care. +Percentage of children's households reporting use by any children.

Annualized Estimates of Third-party-reimbursable-type Services<sup>1</sup>  
per 1,000 Population, 81 Local Health Departments<sup>2</sup>  
North Carolina, March 1981 (38)

	<u>State Average</u>	<u>Range of Local Values</u>
Total	356	71- 942
Epidemiology	85	14- 381
Adult Health	75	0- 459
Maternal and Child Health	184	10- 690
Dental Health	12	0- 126
White Males <sup>3</sup>	162	34- 707
White Females <sup>3</sup>	319	39-1131
Nonwhite Males <sup>3</sup>	433	0-1062
Nonwhite Females <sup>3</sup>	898	23-1999

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<sup>1</sup>A patient may be counted multiple times. <sup>2</sup> Includes 5 districts, 2 of which subsequently split. <sup>3</sup> Excludes services of unknown race-sex of patient (10.4%).

From the above, it is clear that maternal and child health services are a major thrust of health departments and that nonwhites and females are the chief benefactors of patient services. Direct-patient dental services are not generally available (only 28 departments reported any).

Previous surveys of health departments have elicited data on all local services. The survey in March 1979 resulted in annualized statewide estimates of 2.6 million medical services and 0.5 million environmental services per year. Medical services represented a rate of 462 per 1,000 population; environmental services were of the following types: water and sewage disposal, 58%; food and lodging, 24%; solid waste, 7%; other, 11%. In the March 1980 survey, annualized medical services totaled more than 3 million or 522 per 1,000 population; data on environmental services were not reported by all departments. (42,69)

Based on the surveys just described, local health department personnel increased 13 percent between 1979 and 1981. Increases were largely among laboratory and direct-service personnel; the number of administrative/clerical employees dropped 1 percent while sanitarians/technicians and health educators increased by only 4 percent each.

Other service data reported by health departments include activity counts for certain direct-service programs. The following statewide participation rates are also available on a county-of-residence basis (38):



Program Participation Rates  
North Carolina (38)

-Crippled Children's Services per 1,000 population 0-20 (1980)	12.4
-Early Periodic Screening, Diagnosis & Treatment (EPSDT) clients as a percent of eligibles (FY 1981)	44.0
-Active Family Planning Patients as a percent of estimated women in need (1980)	27.3
Ages 13-19	19.8
Ages 20-44	33.3

Finally in the area of public health services is that dimension called fiscal resources which grew rapidly during the last decade as state and federal categorical programs increased in number and scope. As a result, per capita governmental expenditures for health and hospitals in North Carolina increased from \$28 in 1968 (70) to \$124 in 1980 (5). Still, 1980 per capita amounts were greater in 30 other states including five of seven South Atlantic states and all of North Carolina's nearest neighbors. For example, compared to N.C.'s \$124, per capita amounts were \$128 in Virginia, \$166 in Tennessee, \$181 in South Carolina, \$216 in Georgia, \$142 nationwide. Concerning this state's apparent shortfall, the following findings for 1980 intergovernmental finances are noted:

- N.C.'s state government expenditure of \$76 per capita for health and hospitals compares to \$79 nationwide; 22 states were higher (5).
- Total federal aid to state and local governments was \$328 per capita in N.C. compared to \$396 nationwide; 44 states were higher. In aid from the U.S. Department of Health and Human Services, per capita amounts were: Public Assistance, \$83 in N.C. vs. \$107 nationwide; Medicaid, \$50 in N.C. vs. \$62 nationwide. (5)

The Division of Health Services' FY 1982 expenditures totaled \$117 million of which 30 percent was for local health departments and 23 percent was paid to WIC vendors. The remainder covered provider and administrative costs including the support of Lenox Baker and McCain hospitals and 19 Developmental Evaluation Centers. Additionally, local appropriations and fees accounted for \$53 million, resulting in total government expenditures of \$170 million for physical and environmental health services. Dollars for mental health and county hospitals are not included in these figures. (38)

Summaries of the FY 1982 expenditures of all health departments and each individual department are found in the county-specific Health Data Book (38). In combination with local program-utilization statistics, those program-specific financial data should allow for a fairly comprehensive assessment of a

particular department's plans and operations relative to those of other departments in the state. Based on other county government expenditure data found in the Data Book, health departments may also assess levels of local support for public health services vs. other human services and total county services. Statewide, public health services accounted for about 20 percent of all human service expenditures and 6.4 percent of total county expenditures during FY 1981. Those percentages varied widely among the counties.

By and large, the North Carolina public health service and financial data described in this section reflect the combined efforts of about one thousand employees of the Division of Health Services and more than 5,000 health professionals who staff nearly 300 clinic sites in the state's 83 public health jurisdictions. Those efforts, of course, are greatly complemented and enhanced by the efforts of workers in mental health and other human service programs and organizations, both public and private.



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## APPENDIX I

Promoting Health/Preventing Disease:

A Compendium of Health Goals for 1990





Promoting Health/Preventing Disease:  
A Compendium of Health Goals for 1990

Subject of the Objective

(f)  
Comments/Sources/Definitions

(A) N.C. 1970-80 Annual Change (%) <sup>1</sup>	(B) U.S. 1980-90 Expected Annual Change (%) <sup>2</sup>	(C) N.C. 1980 Statistic	(D) N.C. 1990 Projected Statistic <sup>3</sup>	(E) U.S. 1990 Goal <sup>4</sup>
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PREGNANCY STATISTICS

- Percentage of abortions performed after the first trimester

N.C. decline is based on 1974-80 period.

- Birth rates, mothers under age 15

mothers age 15  
mothers age 16  
mothers age 17

7.2  
About 0  
13.2  
31.2  
53.0

6.0  
About 0  
10.0  
25.0  
45.0

- Percentage of liveborns weighing 2,500 grams or less

Nonwhites  
Number of counties above 9.0

-5.8  
-1.6  
-1.9  
-2.7  
-3.4  
-1.4  
-1.6  
-2.5  
-2.5  
-

10.6  
1.6  
17.6  
38.1  
59.5  
7.9  
11.8  
26

7.2  
About 0  
13.2  
31.2  
53.0  
5.9  
8.8  
Under 4

6.0  
About 0  
10.0  
25.0  
45.0  
5.0  
9.0  
zero

U.S. data are for blacks.  
N.C. 1990 based on number greater than 12.0 in 1980. U.S. goal may be unrealistic.

- Percentage of mothers receiving no prenatal care prior to the fourth month

Nonwhites  
Number of counties above 10.0

-3.3

-6.3

37.4

13.8

10.0

U.S. goals are specific for counties and race/ethnic groups.  
N.C. decline is based on 1974-80 period; U.S. data are for blacks.  
N.C. 1990 based on number greater than 27.0 in 1980. U.S. goal appears unrealistic.

MORTALITY STATISTICS

- Neonatal death rate

-4.5

-2.3

9.9

7.6

6.5

Defined as fetal deaths of 28+ weeks gestation and infant deaths under 7 days.

- Perinatal death rate

-4.8

-4.9

14.3

7.3

5.5

- Infant death rate

Nonwhites  
Number of counties above 12.0

-4.0  
-4.6  
-

-2.8  
-4.1  
-

14.4  
19.4  
65

10.4  
11.4  
Under 32

9.0  
12.0  
zero

U.S. data are for blacks.  
N.C. 1990 based on number above 16.7 in 1980. U.S. goal appears unrealistic.  
Comparability ratio of 1.10 applied to 1970 N.C. rate.

- Maternal death rate

Nonwhites  
Number of counties above 5.0

-8.2  
-8.4  
-

-4.4  
-7.3  
-

5.9  
11.0  
5

3.3  
3.0  
Under 5

5.0  
5.0  
zero

U.S. data are for blacks. See above note. N.C. rates are highly subject to random fluctuation.

# Promoting Healthy/Preventing Disease: A Compendium of Health Goals for 1990

Subject of the Objective

(F)  
Comments/Sources/Definitions

(A) N.C. 1970-80 Annual Change (%) <sup>1</sup>	(B) U.S. 1980-90 Expected Annual Change (%) <sup>2</sup>	(C) N.C. 1980 Statistic	(D) N.C. 1990 Projected Statistic <sup>3</sup>	(E) U.S. 1990 Goal <sup>4</sup>
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- Motor vehicle death rate Age Under 15	-2.2 -2.6 -0.5	-2.4 -2.8 zero	26.7 9.7 3.8	20.3 7.0 3.0	18.0 5.5 3.0
- Drowning rate					
- Falls death rate	-1.7	-5.3	5.3	2.5	2.0
- Cirrhosis of the liver death rate	-0.2	-1.1	12.2	10.9	12.0
- Other drug-related death rate	+0.2	-1.9	1.4	1.1	2.0
- Homicide rate, nonwhite males 15-24	-4.3	-1.4	35.1	30.2	under 60
- Suicide rate, ages 15-24	+11.1	-0.9	11.4	10.4	under 11
- Age-specific death rate, ages 1-14	-3.5	-1.8	39.4	32.3	34.0
ages 15-24	-1.4	-1.9	118.7	96.1	93.0
ages 25-64	-2.4	-1.9	555.2	449.7	400.0

U.S. goals are from the Health Resources Administration, National Health Planning Goals—the National Guidelines for Health Planning, September 3, 1980. Goals actually were not given a specific time frame.

## WORK-RELATED ACCIDENT STATISTICS (private sector)

- Disabling injury cases per 100 full-time workers	NA	-0.9	7.0	6.4	8.3
- Lost workdays due to injuries per 100 workers	NA	-1.5	37.2	32.2	55.0

N.C. data are for 1981 and include all injuries, not just "disabling."  
N.C. data are for 1981 and include restricted activity days.

## LIFESTYLE INDICATORS

- Percent of adults who smoke	NA	-2.4	36.7	under 28	under 25
- Per capita per year consumption of legal absolute alcohol (gallons)	NA	zero	2.18	2.18	2.82
- Percent of adults participating in regular exercise	NA	+1.4	44.0	over 50	over 60

U.S. data are for persons 20+.  
N.C. data are from the N.C. Citizen Survey 1980, persons 18+.

U.S. goal is to maintain U.S. data for persons 14+; N.C. data are for persons 18+, from the State Alcoholism Profile Information System.

U.S. goal is for persons 18-64, based on survey of persons 20-64. N.C. data are from 1979 N.C. Citizen Survey, persons 18+ reporting planned exercise several times a week.

<sup>1</sup> 1970-80 except as otherwise noted. <sup>2</sup> Based on most current data; the base year varies among objectives. <sup>3</sup> Item (B) applied to item (C). <sup>4</sup> U.S. Dept. of Health and Human Services, Promoting Healthy/Preventing Disease: Objectives for the Nation, Fall 1980.



## PUBLIC HEALTH IN NORTH CAROLINA HISTORICAL HIGHLIGHTS 1877-1983

### APPENDIX II

#### Public Health In North Carolina:

#### Historical Highlights 1877—1983





## PUBLIC HEALTH IN NORTH CAROLINA HISTORICAL HIGHLIGHTS 1877—1983

- 1877- N.C. Board of Health established.
- 1879- Free smallpox vaccination; failure to comply with health regulations declared a misdemeanor.
- 1886- First issue of *The Health Bulletin*, the first publication of this type in the U.S.
- 1893- Passage of health act establishing rules of quarantine and giving Board of Health oversight and care of inland waters, systems of water supply and sewage disposal, common carriers and public institutions.
- 1903- Passage of bill requiring the registration of nurses.
- 1905- Laboratory of Hygiene established; compulsory vaccination in Hyde and Washington county schools upheld as legal.
- 1907- State Sanatorium for Tuberculosis established at Montrose in Hoke County.
- 1909- Position of fulltime State Health Director established with an annual salary of \$3,000, secretary of the Board to serve; Rockefeller Sanitary Commission organized to carry out hookworm campaigns.
- 1911- Organization of the Guilford County Health Department, the second county health department in the U.S.; organization of the N.C. Public Health Association.
- 1912- Organization of the Robeson County Health Department, the first strictly rural health department in the U.S.
- 1913- Vital Statistics Law (births and deaths) enacted; Bureau of Tuberculosis Control created.
- 1915- Free typhoid vaccination.
- 1917- Free dental clinics for school children.
- 1918- Laboratory began manufacture and distribution of biological products, i.e., antitoxins and vaccines for diphtheria, tetanus, smallpox, typhoid, and pertussis; appointment of first dentist to a state public health program.
- 1919- Sanitary Privy Law.
- 1920- Sex hygiene education instituted.
- 1921- Law requiring the physical examination of applicants for marriage.
- 1924- System for county control over midwives established.
- 1935- Industrial hygiene program implemented; passage of the Social Security Act.
- 1936- School of Public Health and a Department of Public Health Dentistry established at the University of N.C.; Crippled Children's Service initiated; venereal disease control emphasized.
- 1937- N.C. the first state to include birth control as part of its public health program; procurement of the first Negro physician ever employed by a state health department; employment of a qualified nutritionist.
- 1940- Law requiring blood test of all expectant mothers in order to establish evidence of syphilis.
- 1944- Hospital and Medical Care Commission appointed.
- 1945- Compulsory immunization against whooping cough and smallpox.
- 1949- Mental hygiene program implemented; public health services in all 100 counties.
- 1950- Program for fluoridation of public water supplies initiated.
- 1951- Veterinary public health program instituted.
- 1956- New county health facilities provided by state, local and Hill-Burton funds.
- 1957- Enactment of revised and recodified public health laws.
- 1958- Registration of divorces and annulments required by law.
- 1959- N.C. first state to legislate compulsory immunization against poliomyelitis; Department of Water Resources created; radiation control services established.
- 1961- State's first Developmental Evaluation Clinic established in Winston-Salem.
- 1962- Registration of marriages required by law.
- 1963- Department of Mental Health created; air pollution control authorized.
- 1966- Screening of newborns for phenylalanine (PKU); distribution of live measles vaccine; implementation of Title 18 (Medicare).
- 1967- First liberalization of N.C. Abortion Statute; Multiphasic and cervical cancer screening; Emergency Medical Services Program established.
- 1968- Statewide Medical Examiner System implemented; Driver Medical Evaluation Program established.
- 1970- N.C. first state to conduct statewide nutrition survey; implementation of Title 19 (Medicaid).
- 1971- Creation of the N.C. Department of Human Resources.
- 1973- Legalized abortion (on request) and state's first freestanding abortion clinic; Division of Facility Services and Office of Rural Health Services created; legislation allowing adoption of reasonable standards to govern local health services.
- 1974- Enactment of National Health Planning and Resources Development Act creating Health Service Areas; Women, Infants and Children (WIC) Program; Federal Safe Drinking Water Act.
- 1975- Expansion of Developmental Evaluation Clinics to include screening of 4-year-olds; implementation of Title 20 (social services programs including various health services components).
- 1976- Federal Resource Conservation and Recovery Act.
- 1977- N.C.'s Public Health Centennial; formation of Hospice of North Carolina, the first state association to assist local developers.
- 1979- Re-write of N.C. Immunization Law; new Human Tissue Donation Program.
- 1980- N.C. Solid Waste Management Act (for hazardous waste); creation of State Center for Health Statistics within the Division of Health Services.
- 1982- Creation of Environmental Epidemiology Unit within the Division of Health Services.
- 1983- Passage of the Safe Roads Act; recodification of N.C.'s public health laws.





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